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ABSTRACT

Information concerning programs and materials for environmental education is provided. In the report, environmental education is defined as: ". . . the educational process dealing with man's relationship with his natural and manmade surroundings, and including the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment." Generalizations are made from research regarding learners, instructional materials, facilities, and program organization. Brief descriptions and summaries are given of selected existing programs and materials in terms of general characteristics. In addition, examples of current urban environmental problems are provided, and recommendations related to needed environmental education programs are made. Materials evaluated as useful for elementary and secondary school programs in urban areas are listed. Problems shared by a number of environmental education programs are discussed, and programs, curriculums, and materials are recommended. Five case studies are provided as descriptions of procedures followed in developing and implementing environmental education programs. The remainder of the report is comprised of brief descriptions of selected environmental education programs, projects, and materials considered of value in program development and implementation in schools. Names and addresses are given of governmental agencies that have programs relating to the environment and are information sources. References to environmental material included in current issues of RIE and CIJE are provided. Ordering information for PREP Reports is given. (DB)

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Environmental Education Programs and Materials

PREP Report No. 33

by

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Introduction

Information about programs and materials for environmental education is in great demand today. Schooling in the United States, though not always responsive to the demands of society at large, does for the most part involve itself in the crises of the community and the Nation. Although one may question whether society is willing to pay the cost of altering the environment, whether the current high level of interest in a better environment will be sustained, and even whether all "environmental problems" are real problems, the schools are being called upon increasingly to engage children in programs dealing with environmental education.

The passage of the Environmental Education Act, with increasing levels of appropriations anticipated, is an example. The ever-growing number of environmental education centers throughout the United States, the efforts on the part of States to create comprehensive environmental education plans, the rising number of applications to the National Science Foundation's Curriculum Improvement and Development Section, and to the U.S. Office of Education, plus a host of other indicators at both the State and Federal levels support the contention that environmental education is "in." Thus, the demand for environmental education programs is being generated at the Federal level both within and outside the traditional agencies associated with education, within State education agencies, community groups, school curriculum committees, and by teachers and students individually.

As the demand has grown, it has become increasingly important that administrators and teachers have ready access to available materials and sources of curriculum ideas. This report provides such information about environmental education. Other sources should also be explored, particularly for current information, including the resources of the Educational Resources Information Center (ERIC) system; educational journals such as *Social Education, The Instructor,* and *The Journal of Environmental Education;* announcements from industry; Congressional reports; Federal agencies such as the Department of Agriculture and the Department of the Interior; and service organizations such as the Sierra Clubs.

NOTE.—This report was adapted from the following three documents which constitute the final report of the targeted communications project on environmental education: *A Review of Environmental Education for Elementary and Secondary School Teachers, A Review of Environmental Education for Teachers of Urban/Disadvantaged,* and *A Review of Environmental Education for School Administrators.* All three volumes will be available from the ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Md. 20014 in microfiche and hard copy.

Environmental Education Defined

For the purposes of this report environmental education is defined as:

> . . . the educational process dealing with man's relationship with his natural and manmade surroundings, and including the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment.[1]

While no uniformly accepted definition of environmental education is currently in use among practitioners, the U.S. Office of Education notes that some agreement does exist concerning the basic characteristics of good environmental education, which include:

- A multidisciplinary approach, with an emphasis on the interrelationships of man and nature.
- A focus on contemporary problems relating to the urban and rural environment—manmade and natural.
- Incorporation of nonformal as well as formal education processes and utilization of resources outside the classroom.
- Development of understanding and attitudes as well as information.

[1] The Environmental Education Act (Public Law 91–516).

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- Involvement of all age groups.
- A participant-centered design, involving each learner/participant in choosing priorities, i.e., both the issues to be studied and the solutions that seem most appropriate. This design allows the participant to learn "how to learn" about new situations, how to weigh alternatives, and how to test solutions.

Most good programs involve action-oriented activities.

RELATED RESEARCH AND ITS IMPLICATIONS

Research Findings

The following generalizations from research regarding learners, instructional materials, facilities, and program organization should provide guidance in the development of environmental education programs and development or selection of environmental education activities. These generalizations emanate from research reviews cited at the end of this section.

- Learning is more likely to occur, if skills or information are learned in a context similar to that in which they are used.
- Students usually learn more easily information or skills which are related to information or skills they have previously learned.
- Other things being equal, the longer the time since an experience, the harder it is to remember. Ideas learned earlier can be reinforced by reuse.
- The more concrete the concept, the more easily it is grasped. Normally, children grasp concepts in order of increasing abstractness and complexity.
- Positive instances (examples of what the concept is) usually are more effective for learning than negative instances.
- Opinions and attitudes developed early in life tend to be influential during later periods in life.
- The relationship between attitudes and opinions and cognitive achievement is not well supported.
- Most opinions and attitudes are not developed during a short span of time.
- Opinions and attitudes are influenced by the geographical region and the urban-rural location in which a person lives.
- Opinions and attitudes can be changed; but it appears that, once a person becomes committed to a position, that commitment itself becomes a barrier to change.
- Activities and materials should be within the ability ranges of the students involved in the activities and using the materials.
- People normally are more highly motivated toward involvement if they have had a role in determining the activity or action.

Implications for Programs and Materials

Environmental education activities and materials should be introduced early in the school program, and should receive continued emphasis throughout the program. Content should emphasize the local areas in which the children live and then expand to other geographical regions. This approach provides experiences that students can relate to psychologically, and concepts which they can grasp more easily. On the elementary level programs should include experiences aimed at developing desired affective, cognitive, and psychomotor outcomes.

Programs and materials for upper-grade students should deal with the local environment as well as with different community settings (urban-rural) and should provide experiences in other regions. These experiences should continue for 1 to 6 weeks and should involve the student in using skills, information, and attitudes in the settings that exist in society. To implement this approach extensive planning and cooperation between the school, the local community groups, and other organizations and governmental agencies are needed. In all grades, but especially the upper elementary and secondary school grades, students should be given considerable opportunity to help determine the problems and topics for study.

These suggestions point up the need for a planned program that provides enough flexibility for students and teachers to make decisions regarding specific program components. A variety of materials are clearly needed, and it would seem that these would vary, both in terms of content and presentation, from urban to rural areas, and within rural and urban areas. Effective programs might sucessfully use materials developed in other areas, but *adapting* and *modifying* materials would be more effective than *adopting* materials.

Implications for Facilities

A considerable portion of the environmental education program should be conducted in real settings (urban, suburban, rural, natural, etc.). This suggests the need for selected sites to which the student can be taken, designed sites at the school, or (if these are not possible) simulations and media presentations which will provide a reasonable representation of the actual setting.

An inventory of existing sites can provide a school with indications of what should be utilized, developed, or purchased for sites or simulation materials. A review of school programs indicates that those which inventory and use community resources are not as limited by facilities as are many programs which stay within the school building or which use a set facility (such as a nature center). Cooperation and coordination with governmental agencies (city, county, State, and Federal), local groups, and school personnel can often provide the diversity of facilities needed without the large capital expenditure and operating budget required by single school ownership and management.

References Cited

Berelson, Bernard, and Gary A. Steiner. *Human Behavior, An Inventory of Scientific Findings.* New York: Harcourt, Brace & World, Inc. 1964.

Inventories and summarizes over 900 research studies related to human learning and behavior.

Gage, N. L., editor. *Handbook of Research on Teaching.* American Educational Research Association. Chicago: Rand McNally Co. 1963.

Reviews and summarizes several thousand studies related to teaching and learning at all levels.

McCloskey, Elinor F. *Urban Disadvantaged Pupils.* Portland, Ore.: Northwest Regional Educational Laboratory. 1967.

Synthesizes 99 research reports related to urban disadvantaged youngsters.

Roth, Robert E., and Stanley L. Helgeson. *A Review of Research Related to Environmental Education.* Columbus, Ohio: ERIC Science, Mathematics, and Environmental Education Information Analysis Center. 1971.

Reviews over 85 studies in environmental education in the areas of programs, materials, instruction, and administration.

Review of Selected Programs and Materials

Examination of a list of environmental education programs might lead one to believe that a large number of programs are operational throughout the country. A moment's reflection, however, reveals this to be highly misleading. When the number of such programs is compared to the number of school districts (about 18,000) in the Nation, it is clear that relatively few have functional programs in environmental education. It is also obvious that the number of schools operating complete K-12 programs is insignificant in relation to the total number of schools. Programs designed for the elementary levels only exist in somewhat higher numbers, but again involve only a minor segment of the student population. Secondary students fare no better; very few programs exist for levels 7-12, although some schools do have units, or sometimes courses, in environmental education within their curriculums.

Just as there is little uniformity among educational practitioners as to how environmental education is defined, so there is little uniformity among environmental education programs and materials. Some are developed around a single problem or theme, while others include broad areas of concern. Some reflect a single discipline orientation, while others are interdisciplinary or multidisciplinary. Some are intended for a limited user group, others are aimed at a broad range of teachers and students. This section briefly describes and summarizes selected existing programs and materials in terms of general characteristics. The list of programs and materials cited is not intended to be exhaustive, but rather representative. Programs and materials cited are described in more detail in later sections of this report.

Types of Programs

School-Based Programs—Summaries of the interviews conducted during this project, questions asked by practitioners, and literature and research reviewed over the past year, indicate widespread agreement that schools should develop environmental education programs on a K-12 basis and that these programs should fit into the existing school curriculum. Several such programs do exist, but, based on the number of school systems in the country, these reflect a relatively small percentage of the total. Examples of programs showing promising trends and practices are noted.

The Ann Arbor, Michigan, Public Schools have a K-12 program designed to present conservation precepts in a logical sequence. The program is integrated within the framework of the existing curriculum and links subject areas together, particularly science and social studies. It emphasizes the study of natural community resources under natural conditions and utilizes direct involvement of the learners in problem-solving situations, with stress on attitudes rather than skills as intended learning outcomes. This program originated, as did most of those in existence, as an attempt to deal with a narrower field of concern, conservation, and has since broadened to be more in keeping with environmental education.

Another K-12 program, in the Madison, Wisconsin, Public Schools, aims at developing a systems approach to environmental education using community and school resources. The interdependence of man with his environment is emphasized. Concept formation is believed to occur when pupils develop understanding, attitudes, and interests which make concepts become positive values. Pupils are directly involved with the environment, utilizing a school forest, a nearby marsh, and sites developed on some of the school grounds. Media (filmstrips, tapes, and films) and team teaching are utilized in the program.

A program which operates within the school structure, but which originated within the Wisconsin Department of Public Instruction, is Project I-C-E at Green Bay, Wisconsin. Its major goal is to improve instruction and curriculum by using environmental education as a vehicle. The areas of social studies, language arts, and science are already included within the program, and plans are being developed to include other areas, such as fine arts, mathematics, and business education. Emphasis is placed upon community resource development and support.

A program modeled after the Ann Arbor, Michigan program is being conducted in Yar-

mouth, Maine; a K-6 program, it emphasizes developing attitudes toward environments. The study environments are selected to provide for expanding scope and complexity of understanding; they range from the school environment at the K-1 level, to the neighborhood for grades two and three, to the community for grades four and five, and, finally, to the region for grade six. Twelve environmental themes involve the students in activities in the environments.

The Billings, Montana, School District is currently operating a program for sixth grades only, but intends to expand it to K-12 in the future—a pattern that is common among school systems in the process of developing plans. This program is somewhat unique in that its first 5 years of operation were funded entirely by local PTA groups. Its aim is to deal with attitudes and actions rather than with the "symptoms" of environmental problems, such as pollution. A 2-day camp experience, the focal point, includes instruction in the four basic areas of ecosystems, geology, geography, and plot studies and experiences in first aid, art, recreation, music, and dramatics.

The Tilton School Water Pollution Program in New Hampshire is developed around a single theme. For grades 7-12, student curiosity is channeled into productive activity and emphasizes activity outside the classroom as a means of making the program relevant to students. High school teachers, students, scientists, and technicians cooperated in developing the curriculum guide, which takes an action-oriented approach to environmental education and draws upon several areas in the sciences and social sciences.

A number of other noteworthy programs are also in operation around the country. These include: the Outdoor School program in Milwaukie, Oregon; the Parkrose Public Schools Conservation Education program in Portland, Oregon; the Marshall Outdoor Laboratory, Lynwood, Washington; the program at Morgan Elementary School, Utica, Michigan; the Bourbon County Environmental Education Project, Paris, Kentucky; the Interdisciplinary Outdoor Education program, Seattle, Washington; the Environmental Education program at Edmunds, Washington; and the Stepping Stone Environmental Education project at Branchville, New Jersey.

School-Related Programs—Many programs do not operate within the school structure but are the result of a cooperative effort involving one or more school systems with a center or facility in the local area or region. Very often these programs are designed to take advantage of some unique features and characteristics of the setting. For example, the Regional Marine Science program in Carteret County, North Carolina, is an operational program that is activity oriented, involves a cooperative effort, and utilizes unique aspects of the region. Ecology is emphasized and the focus is on the field trip as an important teaching strategy in each of the 3-week teaching units for grades 4-10.

The Environmental Science Center program in Golden Valley, Minnesota, also operates cooperatively with area schools, and it includes a K-12 curriculum as well as adult and vocational education components. Forty-three activities, which can be implemented within the existing curriculum have been developed, and no particular sequence is required. This permits the teacher to order the activities as needed. Field trips are available, with center personnel assisting in planning and utilization of facilities. From a primarily science-oriented beginning, the program has expanded and is currently developing materials with greater emphasis on the social aspects of environmental education.

An example of a program with a regional basis is located at the Conservation and Environmental Studies Center at Browns Mills, New Jersey. This program, for elementary and junior high school students, provides week-long resident activities for the students, their teachers, and high school student assistants, as well as college interns. Activities are designed to fit within the school curriculum and to aid teachers in developing their own environmental education programs. While most of the materials created by the center deal with the local environment, many could be easily adapted for use elsewhere.

The Conservation Education Center at Land Between the Lakes, Kentucky, was originally part of a national demonstration center under the auspices of the Tennessee Valley Authority. A basic purpose here is to introduce resident outdoor and conservation education to educators. Very low emphasis is placed on the de-

velopment of materials within the center, but staff personnel aid schools in developing materials for their own use.

The Environmental Education program for grades 1-12 of the Paducah Independent Schools, Kentucky, was designed specifically to be used with the Youth Station Facilities at Land Between the Lakes. Materials and activities were cooperatively planned by Center and school personnel, and require the direct involvement of students with the environment. Most are inquiry oriented and are drawn from the areas of art, social studies, mathematics, and science. Although developed for use with a specific site, most of the activities can be easily adapted for use in other locations.

Other school-related programs, sites, and facilities which can be cited include the Kemmerer Outdoor Laboratory, Kemmerer, Wyoming; the Liberty Council of Schools Conservation Education Center at Lincoln, Massachusetts; the Natural Resources Demonstration Center, DeKalb, Illinois; Schuylkill Valley Nature Center, Philadelphia, Pennsylvania; and the Environmental Education Laboratory, Albuquerque, New Mexico.

National Programs—Two closely related projects have been developed on a national basis for use with local school systems. The National Environmental Education Development (NEED) program, operated by the National Park Service, is an interdisciplinary program based on the premise that environmental awareness requires outdoor implementation of classroom lessons. The plan is designed to aid local school systems in developing teaching materials, programs, and experiences for levels K-12 that will help enrich the existing curriculum with environmental concepts. Emphasis is on organizing activities around five conceptual strands that run through lessons in mathematics, science, art, social studies, and communications.

The National Environmental Study Areas (NESA) program of the National Park Service also makes use of natural and cultural sites as environmental study areas to provide different kinds of learning experiences for students in grades K-12. Areas have been designated throughout the Park system and on other lands as environmental study areas for use by local school systems. The program is also developed around five environmental strands, and the NESA guidelines provide a framework for teachers to develop programs suitable for local needs. Workshops are conducted to provide teachers with an introduction to the study area, resource materials, and suggestions for adapting the experiences into the school curriculum.

Materials

Although the quality of existing materials on environmental education varies, there is a reasonably large number of packages from which to choose. There is less variety of good material for early elementary grades, however, than for grades four through 12. Although much of what is available might be useful for good readers in the inner city or might have worthwhile content, it must be noted that low reading level and appropriate content may not always be found in the same package. Materials to enhance the self-image of the ghetto child are also often difficult to find.

Much of the material is interdisciplinary in scope to the extent that it draws on the concepts and generalizations of most of the social or physical sciences, but rarely both. Among the social sciences, anthropology and sociology are probably the least represented in the packages analyzed. However, a great deal of what is available can be utilized to supplement or enrich ongoing courses.

While many of the materials reviewed are traditional in content and strategy, some utilize a wide range of multimedia and classroom strategies. Among the most useful are perhaps those that incorporate various modes of inquiry, discovery, participation, and group research. For the most part, the materials are school- and classroom-oriented and are not geared to action programs.

Most of what has been reviewed would need to be adapted to local and individual conditions. That is, most of the materials would not fit easily into the ongoing curricular programs within the typical elementary or secondary school. This presents two related problems.

In the first case, administrators and teachers

must make decisions about *where* within an ongoing program it is appropriate to place a particular unit dealing with a particular environmental problem. Secondly, most administrators and teachers will find that materials lack *particular* components which they feel are essential to include. The first problem can be defined as a problem of articulation and is solved when those who make curriculum decisions look closely at the conceptual scheme being followed by the teacher and logically find an appropriate place to insert the selected unit. The other problem is much more difficult to solve.

By carefully selecting and adapting, the curriculum developer can, however, develop materials suitable for the needs of his students, project, community, and region. Examination of operating programs will provide ideas on ways in which materials have been and can be used. Because most existing environmental education programs had their origins in science, conservation, or outdoor education, many of them tend to reflect this orientation in both materials and processes. It is therefore especially important that teachers and curriculum developers pay close attention to social science and related materials when designing learning experiences.

The following selected programs, classified by grade level, utilize materials which can be adopted or adapted for the teaching of environmental education. See the descriptions in a later section for details on the materials.

For Elementary School Pupils

- American Geological Institute Environmental Studies Project (1–12)
- University of Minnesota Project Social Studies: *Family of Man* (K–5)
- Joint Council on Economic Education *Natural Resource Use in Our Economy* (3–12)
- Educational Research Council of America *Concepts and Inquiry* (4–6)
- Group for Environmental Education, Inc. *Our Man-Made Environment, Book Seven* (4–11)
- Field Social Studies Program
  Working, Playing, Learning (1)
  People, Places, Products (2)
  Towns and Cities (3)
  Regional Around the World (4)
- University of Colorado
  Our Working World: Cities at Work
  Our Working World: Neighbors at Work (2–3)
- Rhode Island College Providence Social Studies Curriculum (K–12)
- Elementary Economics Project, Industrial Relations Center, University of Chicago *Economic Man* (6–8)
- South Carolina State Department of Education, Conservation Curriculum Improvement Project *People and Their Environments* (1–12)
- American Association for Health, Physical Education, and Recreation, National Education Association, Association of Classroom Teachers *Man and His Environment, An Introduction to Using Environmental Study Areas* (K–12)
- Interaction Science Curriculum Project *Interaction of Man and the Biosphere* (6–9)
- Science Curriculum Improvement Study (1–6)
- State of California Environmental Education Program *Ekistics* (1–12)
- Education Development Center *Man—A Course of Study* (4–6)

For Secondary School Pupils

- American Geological Institute Environmental Studies Project (1–12)
- Economics in Society (formerly *Econ 12*) (9–12)

- University of California at Berkeley
  Asian Curriculum Project
  Asian Studies Inquiry Program
  Man and His Environment in Asia
  Food and Survival in Asia (10)
- Joint Council on Economic Education
  Natural Resource Use in Our Economy (3–12)
- Educational Research Council of America *Concepts and Inquiry* (7–9)
- Group for Environmental Education, Inc. *Our Man-Made Environment, Book Seven* (4–11)
- Harvard University
  Social Studies Project
  Municipal Politics
  Science and Public Policy (7–12)
- High School Geography Project
  Geography in an Urban Age, Unit 5: Habitat and Resources (7–12)
- Rhode Island College
  Providence Social Studies Curriculum (K–12)
- Social Issues Resource Series
  Population
  Pollution (10–12)
- South Carolina State Department of Education
  Conservation Curriculum Improvement Project
  People and Their Environments (1–12)
- Elementary Economics Project
  Industrial Relations Center
  University of Chicago
  Economic Man (6–8)
- Carnegie-Mellon University
  Slow Learner Project
  Americans in Cities (9)
- American Association for Health, Physical Education, and Recreation
  National Education Association
  Association of Classroom Teachers
  Man and His Environment, An Introduction to Using Environmental Study Areas (K–12)
- Biological Sciences Study Commission
  BSCS Green Version: High School Biology (9–12)
- Interaction Science Curriculum Project
  Interaction of Man and the Biosphere (6–9)
- Addison-Wesley Publishing Company, Inc.
  Air Pollution
  Water Pollution
  Noise Pollution (7–9)
- State of California
  Environmental Education Program
  Ekistics (1–12)
- Educational Research Council of America
  Man and the Environment (7)
- Engineering Concepts Curriculum Project (ECCP)
  The Man Made World (11–12)

Extensive annotated resource lists developed by the ERIC Center for Science, Mathematics, and Environmental Education in cooperation with the Center for Science and Mathematics Education at The Ohio State University are available. The lists include, articles, books, textbooks, units, filmstrips, films, games, and simulations. Resources listed on the following topics are available:

- The Urban Environment
- The Rural Environment
- Water Pollution
- Air Pollution
- Energy
- Solid Wastes
- Land Use
- Population
- Recreation

Resource lists are $1.25 each for one or two, and $1 per copy for three or more, regardless of title. They may be ordered from:

The ERIC Center for Science, Mathematics, and Environmental Education
The Ohio State University
244 Arps Hall
1945 North High Street
Columbus, Ohio 43210

Environmental Education in Urban Schools

The Urban Setting

During the past 50 years, the United States has become predominantly an urban Nation. Over 70 percent of the population of the country currently live on less than 2 percent of the Nation's surface. It is estimated that within the next 10 years between 75 to 80 percent of the people in this country will live in urban areas.

Man should have an awareness and understanding of his community and its associated problems, as well as his natural environment. Urban citizens can directly influence the urban environment by their own activity, at the ballot box on community issues, and in electing representatives. Urban citizens also influence the rural and suburban environment by direct activities and by voting on issues and for representatives.

The typical urban setting presents many environmental problems, often with contrasts from neighborhood to neighborhood. From an analysis of recent publications the following are presented as examples of current urban problems:

- Air pollution due primarily to automobile and industrial emission is greater in most cases for urban areas than for rural or suburban. The problem is usually most critical in many core city areas.
- Many urban dwellers in older buildings often have water pipes made with lead as well as walls covered by paints containing lead.
- Access to recreation areas is limited. Many of the water recreation areas which are accessible are heavily polluted. In many cities, open space has decreased due to construction of roads and buildings.
- Solid waste problems due to garbage, junk, and litter are usually much more serious in urban areas than in suburban or rural areas, and especially serious in inner city areas. Such conditions lead to various health problems, including disease and rat infestation.
- In many cities especially inner city areas, neighborhood deterioration is a serious problem. Problems of abandoned housing, lack of repair to occupied housing, and overcrowding affect the rate of deterioration.
- Problems due to the construction and presence of highways and streets have a negative effect on many urban areas. Road construction often divides areas, encourages zoning changes which affect the neighborhood, and creates noise, congestion, and pollution.

The inner city areas usually have the most obvious environmental problems, though many areas away from the inner city have similar problems. These conditions affect both the residents of the particular area, other residents of the city, people who work in the city, other residents of the State, and visitors.

For many city dwellers some of the traditional environmental topics of preserving wilderness areas, and developing national parks are not central concerns. Many of their concerns are related to the quality of life. While some action has been taken related to these concerns by city groups, environmental organizations, and Federal programs in a number of cities, much needs to be done to improve the urban environment.

Problems and Needs Identified

Interviews, analysis of the literature, and reviews of programs and materials provided considerable information about environmental education programs and materials in inner city schools. Listed below is a series of recommendations, and under each is a discussion of the findings which support the recommendations.

- It was generally felt that urban schools ought to develop environmental education programs.

  Status: In most urban schools environmental education programs have not been developed. Many of the teachers interviewed felt that there was a need for personnel to be assigned to the task of program development, that programs in operation in urban areas should be identified, and that materials (print and non-

print) already developed should be identified.

- Environmental education programs should be developed on a curricular basis for grades K–12.

  Status: Some school systems have developed programs at the elementary school level and at the secondary school level, but have not coordinated the two programs. In other schools experiences are provided throughout the school system, but they have not been developed into a related program. Teachers, supervisors, and administrators interviewed desired examples of model K–12 programs which might be considered. They also felt that information regarding procedures used to develop other K–12 programs would be helpful.

- Programs should stress broad concepts and problem solving, and be oriented toward action programs.

  Status: Most city school systems have *not* developed programs with these characteristics. Persons interviewed had questions regarding sources of programs with these characteristics, materials used in such programs, and procedures by which the programs were established.

- Urban schools should utilize local environments and should stress local environmental problems.

  Status: Nearly all school personnel interviewed agreed that this was desirable. While some schools are making excellent progress in this direction, many are not. Analyses of existing school programs indicate that more experiences in urban environments are being provided. Many programs, however, still are oriented primarily to the environment outside the city, rather than to the urban environment. Analyses of existing school sites at many locations throughout the country indicate little concern for the development of study areas around the schools. Most school sites observed, which were developed during the past year or are being developed at the current time, show little change in site design. Teachers and administrators requested information on programs and materials developed that focused on the urban environment. They also requested information on site plans for school study areas and for modification of school buildings to improve environmental education programs.

- Programs and materials should be interdisciplinary using concepts and methods from various disciplines to focus on environmental problems.

  Status: While many of the programs being developed are interdisciplinary, most of the materials that have been produced have been primarily science- or conservation-oriented and have not provided a broad consideration of many problems. Materials received in recent months at the ERIC Center for Science, Mathematics, and Environmental Education indicate more interdisciplinary materials and programs are being developed. It was felt by most persons interviewed that current information regarding such developments should be made available to all schools in the country.

- Materials are needed which are flexible, that is, they should be modular in style, ungraded, and make use of a variety of media.

  Status: Analyses of materials reviewed and information regarding materials being developed indicate examples of such materials are available and more will be available within the next year. While some urban schools have a few such units or modules, very few have the variety and number needed.

- Materials should be available which are relatively easy to read. Selected materials should be made available in a second language, such as Spanish.

  Status: While some materials indicate an effort to reduce the reading requirements of the materials, most do not. There is a definite need for materials which are designed for educationally disadvantaged students.

- Environmental education programs should involve the total community.

Status: Most urban school programs have not obtained intensive community involvement. Several schools requested information regarding "models for involving the community." Teachers and administrators indicated a willingness to act as change agents, but they would prefer to be co-equal partners in the process, rather than defensive program leaders.

- Evaluation of the effect of programs and materials on students and communities is needed.

  Status: Reviews of programs and materials included requests for evaluative data. At the time these materials were collected (spring and summer, 1971) very few schools and material developers had "hard" evaluative data regarding the effects of their programs and materials. Instruments and techniques to use in such efforts were requested.

Generally speaking, students, teachers, and administrators in urban schools were quite explicit in their statements concerning the quality and kind of environmental education programs which they felt were most desirable for their school situation. School personnel and students felt that in the past most educational programs have been content-fact oriented, geared to middle-class suburban experiences, and perceived as dysfunctional by both students and parents in the ghetto area. The request was, therefore, for community-based programs which are open-ended and problem- or process-oriented, rather than content- or discipline-oriented. The students, teachers, and administrators felt action or participatory activities have considerable merit, and many were concerned that positive self-image should be the result of exposure to any classroom experience. There was a number of requests for bilingual materials for urban programs.

A necessary corollary to appropriate content has to do with the teaching strategy incorporated in the curriculum. The most fruitful directions seem to have to do with problem-solving and conflict analysis approaches. Inquiry-discovery, intense observation, and group research in a nonauthoritarian atmosphere were also considered useful techniques.

The urban materials certainly should be interdisciplinary, written at suitable reading levels using an idiomatic vocabulary, and there should be ample provisions made for the use of audiovisual nonprint media.

The kinds of information about various curriculums which urban teachers and administrators advised would be useful had to do with name of curriculum, publisher, availability, costs, and format. They were interested in the rationale and objectives outlined by the developer, the flexibility of the content, and indications of the kinds and extent of media employed. Other sorts of pertinent data which were requested had to do with structure of the course, grade level, reading level, discipilne orientation, topical breakdown of content, prerequisites to use, teaching strategies employed, and finally, evaluative data.

There was an interest expressed in all sorts of annotated bibliographic information such as lists of curriculums, materials, films, records, books, articles, tested activities, kits, and experimental programs; lists of free or inexpensive materials; lists of resource materials to "educate" teachers; lists of community resources, such as government agencies, community organizations, private groups, and experts; lists of community on-site programs; lists of inservice opportunities; lists of colleges and universities with specialized courses; and lists of funding agencies, both government and private. Many suggested that a newsletter or publication would be an excellent vehicle in assisting them to keep updated and current.

Two kinds of evaluative instruments were perceived as necessary to set standards for the field. One kind of evaluation that teachers want has to do with the problem of accountability. As community goals and objectives are determined, it is essential to have available mechanisms to test how well the school and its resources are implementing these objectives. The teachers and administrators would like instruments to evaluate what cognitive and affective achievement has been made.

A second sort of evaluative tool requested was one which could be applied to programs and materials themselves. As it becomes necessary to select materials, there should be

some sort of standard mechanism with which comparable judgments can be made.

Grades 1–12 School Programs

While relatively few school systems have developed 1-12 environmental education, even fewer have 1-12 programs with an urban emphasis. There are a few such programs, however, which can offer alternative models for program development.

Ann Arbor, Michigan, is an excellent example of a local school district which has developed a K–12 program. The program stresses the linking of subject areas, particularly science and social studies, so that both social and scientific concepts which are important in understanding and solving resource problems can be developed. Attitudes rather than skills are stressed, and the learner plays an active role in the learning process. Environmental problems of local, regional, and national concern are included in the program. Field experience is an integral part of most activities. Resource sites are available for each grade level theme, and inservice education is provided for district teachers.

Madison, Wisconsin, has also developed a K–12 environmental education program for students based upon a logical conceptual framework involving all disciplines. Sites have been planned for this program, workshops are provided for teachers, and instructional materials have been developed which emphasize urban concerns.

Other cities, currently developing extensive programs include Green Bay, Wisconsin, and San Diego, California.

A number of programs have been developed to provide opportunities for urban students to gain experiences and understandings regarding the natural environment and the manmade environment. Some of these sites are available within cities, while others are located near cities.

The National Park Service is involved in a massive effort to provide sites in many States, the District of Columbia, Puerto Rico, and the Virgin Islands for environmental education. Sites intended for day visits by local schools are called National Environmental Study Areas (NESA); sites equipped for overnight or longer stays are titled National Environmental Education Development (NEED) camps. The study areas include both natural and manmade locations. The areas have been selected to (1) introduce the student to his total cultural and natural environment, past and present and to help him realize he is part of it, (2) develop in the student an understanding of how man is using and misusing his resources, and (3) to provide the student with an opportunity to work directly with environmental problems. Materials are designed to provide pre-site, on-site, and post-site experiences. Six themes or environmental strands are stressed: variety and similarities, patterns, interaction and interdependence, continuity and change, evolution, and adaptation.

A number of cities are fortunate in having natural land areas available to students for environmental education programs. Such cities include Columbus, Ohio; Portland, Oregon; Washington, D.C.; and New York City. An example of this type of site and program is High Rock Conservation Center in New York City. High Rock provides a natural setting for schools to use and also has instructional materials related to the use of the site developed for teachers and students in grades 1-12. Materials provide pre-site, on-site, and post-site suggestions for the teacher and for the student. Self-guided tours can also be taken on the site.

Museums provide environmental education programs for schools and school age children in many cities. Among such agencies with environmental programs are the Oregon Museum of Science and Industry, Portland, Oregon, and The Center for Science and Industry in Columbus, Ohio.

Elementary School Programs

A number of school systems and regional groups have developed programs with an urban emphasis at the elementary school level. Programs have been established in San Diego, California; Los Angeles, California; Bronx, New York; Portland, Oregon; and several cities in Maine.

Two of the programs are listed in the program descriptions. One, the Wave Hill Center

for Environmental Education, has been used sucessfully in a number of public schools in districts 10 and 12 of the New York Public School System. The approach is interdisciplinary. It stresses interrelationships of man and his environment and focuses first of all on the environment inside the classroom. This includes the psychological and physical environments. Emphasis is also placed on having the student experience as much as possible of life outside the classroom, including both natural and man-contrived environments. A strong effort is made to have students work on projects in groups or as individuals rather than as a class.

A second program which received high ratings is the Regional Environmental Program in Maine. This program is a comprehensive environmental program designed for grades K–6. It focuses on developing attitudes toward study environments, their biological and physical elements, and their associated environmental problems. At the kindergarten and grade one levels, the school environment is emphasized; at grades two and three, the neighborhood; at grades four and five, the community; at grade six, the region. The materials for the program are such that they could be used in a rather flexible manner. Suggestions for prefield, field, and postfield trip activities are given.

Secondary School Programs

A number of city school systems have been involved in reorganizing parts of the secondary school curriculums and even reorganizing major aspects of the total school program.

One of the more unique programs has been established in Philadelphia, Pennsylvania. The Parkway Program is designed to use the total city environment as the classroom and the life of the city as the curriculum. This program emphasizes a humanistic philosophy and attempts to develop individuals who understand the community and its problems. It is further designed to develop individuals who are self-directed and self-reliant.

A second interesting program is the Chicago Public High School for Metropolitan Studies (Metro). This experimental 4-year program (high school without walls) was modeled after the Philadelphia Parkway Program. The program is multidisciplinary permitting students to study education in a community setting.

The Conservation and Environmental Studies Center at Browns Mills, New Jersey, has developed an extensive environmental education program. In 1970 more than 70 schools were involved. The program of the center includes development of K–12 curriculum materials, a field study program, a day study center, and a teacher education program. Extensive cooperation between school and university personnel has been achieved. The consortium plan permits the employment of specialized personnel and the development of special materials relevant to the local students. The teacher education program develops teachers who are competent to work with their own students in a variety of settings. Several publications of this center relate directly to urban environmental education and activities that can be used in urban settings. The materials are flexible.

The Environmental Science Center in Minneapolis, Minnesota, has developed an extensive program for students and teachers in grades 1-12, as well as for adults. A series of 39 curriculum activities has been developed, and other materials are being developed. Inservice programs for teachers are available. A number of the publications produced by the center relate to urban environmental problems and settings.

Materials

Although much of the environmental education material might be useful for good readers in the inner city or have worthwhile content, a low reading level and appropriate content may not always be found in the same package. In fact, most of the materials are not designed for pupils with low reading ability. Material to enhance the self-image of the ghetto child is also often difficult to find.

Much of the material is interdisciplinary in scope to the extent that it draws on the concepts and generalizations from most of the social science and science disciplines. Anthropology and sociology are probably the least represented of the social sciences in the packages analyzed. There has been little balance achieved, however, among science, social sci-

ence, and valuing in materials reviewed. Components of each of these aspects are available separately. A great deal of what is available can be utilized to supplement or enrich ongoing courses, however.

While many of the projects reviewed are traditional in content and strategy, there is a fair number which utilize a wide range of multimedia and classroom strategies. Among the most useful are perhaps those that incorporate various modes of inquiry, discovery, participation, and group research. For the most part, the materials are school and classroom oriented and are not geared to action programs.

It is revealing to look at the developer's rationale and objectives for developing material. The detailed reports are often unavailable, but most of the materials did undergo evaluation and were revised on the basis of those evaluations. Most of the instruments used for evaluation were devised to test how well the stated objectives were being achieved, so it can possibly be inferred that the developer planned revisions in this light.

For Elementary School Programs—Materials evaluated as especially useful for elementary school students in urban areas include the following:

- Educational Research Council of America
  Concepts and Inquiry (4–6)
- Elementary Economics Project
  Industrial Relations Center
  University of Chicago
  Economic Man (6–8)
- Group for Environmental Education, Inc.
  Our Man-Made Environment, Book Seven (4–11)
- Field Social Studies Program
  Working, Playing, Learning (1)
  People, Places, Products (2)
  Towns and Cities (3)
- University of Minnesota Project
  Social Studies: *Family of Man* . . . . . (K–5)
- Colorado, University of
  Our Working World: Cities at Work
  Our Working World: Neighbors at Work (2–3)
- Rhode Island College
  Providence Social Studies Curriculum (K–12)
- South Carolina, State Dept. of Education
  Conservation Curriculum Improvement Project
  People and Their Environments (1–12)
- American Geological Institute
  Environmental Studies Project (1–12)
- Center for Urban Education
  Planning for Change (4–6)
- *Man—A Course of Study*
- American Association for Health, Physical Education, and Recreation
  National Education Association
  Association of Classroom Teachers
  Man and His Environment, An Introduction to Using Environmental Study Areas (K–12)
- Research Council of America
  Man and the Environment (7)
- State of California
  Environmental Education Program
  Ekistics (1–12)
- Materials and Activities for Teacher and Children (1–6)
  (MATCH)
- Science Curriculum Improvement Study (1–6)

For Secondary School Programs—Materials evaluated as being especially useful for secondary school students in urban areas include the following:

- Educational Research Council of America
  Concepts and Inquiry (7–9)
- Group for Environmental Education, Inc.
  Our Man-Made Environment, Book Seven (4–11)
- Harvard University
  Social Studies Project
  Municipal Politics (7–12)
- High School Geography Project
  Geography in an Urban Age, Unit 5: Habitat and Resources (7–12)

- Rhode Island College
  Providence Social Studies Curriculum (K–12)

- Social Issues Resource Series
  Population
  Pollution (10–12)

- South Carolina, State Dept. of Education
  Conservation Curriculum Improvement Project
  People and Their Environments (1–12)

- Carnegie-Mellon University
  Slow Learner Project
  Americans in Cities (9)

- American Geological Institute
  Environmental Studies Project (1–12)

- University of California at Los Angeles
  Committee on Civic Education
  Voices for Justice (9–12)

- *Economics in Society*
  (formerly *Econ 12*) (9–12)

- *The Man-Made World* (8–12)

- *Man—A Course of Study* (4–6)

- American Association for Health, Physical Education, and Recreation
  National Education Association
  Association of Classroom Teachers
  Man and His Environment, An Introduction to Using Environmental Study Areas (K–12)

- Research Council of America
  Man and the Environment (7)

- State of California
  Environmental Education Program
  Ekistics (1–12)

- Addison-Wesley Publishing Company, Inc.
  Air Pollution
  Water Pollution
  Noise Pollution (7–9)

Problems and Recommendations Related to Program Development and Implementation

One problem that environmental education programs share with all programs is the matter of financing. A number of environmental education projects, such as the Rose Tree Media School District (Pennsylvania) Outdoor Education program, have been phased out largely due to shortages of funding. This appears to be an especially serious problem in that many schools, teachers, administrators, and resource people have invested a large quantity of time and money, only to have the bulk of the investment lost at some later time for lack of sustaining funds. Thus, the problem has two major subparts, funding for program initiation and development, and funding for maintenance of the program once it becomes operational. Solutions to these interrelated problems would appear to stem from a single source. Those programs that have been most successful over time appear to be those that have had the best community support in terms of both funding and involvement. Few programs appear to have survived after outside sources of financing were removed unless there was substantial community commitment to them.

Another problem that contributes to the short duration of some programs is their dependence on too few people, often a single, interested, and dedicated person. When that person leaves to take another position, the program, to all intents and purposes, leaves with him. Again the more successful programs have been those that involved a substantial number of people including teachers, administrators, and citizens in the area.

A condition related to the foregoing is the almost total lack of team teaching in environmental education programs. While most centers and facility sites have groups of personnel, many of whom function effectively as teams, teachers within school systems rarely seem to operate in this manner. Whether this situation is due to the teachers' inability, or indifference, to a team approach is not clear. The need for good preservice and inservice education programs, however, seems indicated if they are to capitalize on the less structured, informal aspects of environmental education as highly desirable and available strategies.

Perhaps a related condition is the tendency to fragmentation that appears widespread among the projects. Very few environmental education programs have integrated the various disciplines to any great extent, although most include experiences from the sciences, social sciences, and, to a lesser extent, the arts and humanities. As has been noted earlier in this report, because most of the operational programs had their origins in science, outdoor, or conservation education, most of them still reflect a strong tendency toward the natural sciences in one way or another. It appears almost certain that the lack of team teaching only contributes to this condition. By combining teachers with different discipline backgrounds and interests, the chances for successful integration of ideas and concepts that cut across subject matter areas would seem to be considerably enhanced.

Analysis of existing programs leads to the somewhat surprising finding that a number have very few or no materials. There appear to be two quite different causes for this. The first is the lack of funds for developing and producing materials in sufficient quantity for student use. The second, and educationally sounder, cause is the increased emphasis on learning processes rather than on factual learning. In this case, the lack of materials is not seen as a handicap but as part of a more inquiry-oriented approach to environmental education. There is the further advantage that this strategy tends to be less fixed over time, and teachers tend to use more of their own experiences in ways that seem appropriate for the students and the conditions. The process approach to teaching-learning seems to be more characteristic of programs that have been operating successfully for a longer period of time. It appears that as teachers' understanding of the underlying philosophy of an environmental education program increases, they tend to be less restricted to materials for their teaching purposes. This again suggests the need for well-planned teacher education if environmen-

tal education programs are to be successfully implemented.

Finally, a serious shortage exists in the areas of research and evaluation. While nearly every program includes some form of evaluation, usually of an anecdotal type geared toward making modifications and revisions in the curriculum almost no research is being done to determine the effectiveness of learning experiences. It is encouraging to note, that most of the evaluation tends to stress attitudes and values rather than cognitive outcomes, even if the results provide little in the way of "hard" data for decisionmaking. Changes in this situation will not come about quickly or easily. The problems associated with defining objectives in terms of attitudes and values in such a way that effective research and evaluation can be conducted are not going to lend themselves to superficial solutions. Yet these are the same problems faced by the educational community in general, and are worthy of careful and persistent effort, to solve if education is to make a lasting and worthwhile difference in our environment.

Based on the analyses of programs and materials and the generalizations about them, a number of recommendations can be made concerning programs, curriculums, and materials.

Resources to overcome the problems mentioned above may be available and visible but still not used. Some of the most effective solutions are: (1) conducting inservice institutes close to home which make users of innovations competent to carry out the program; (2) involving teams of colleagues from the same school building or neighborhood, as well as others in the community, in planning and conducting a program; peer support is considered the strongest for utilizing resources for changes; and (3) planning and providing for evaluation and followup support; this includes the use of reliable and validated instrumentation and followup meetings which can be accomplished face-to-face or by telephone or tape. Often programs are accepted or rejected on the basis of total package costs. Other means of calculating costs may prove more desirable such as per-pupil costing and planning materials used on a rotating basis.

There is still a need for production of many more good materials, especially those which balance and synthesize to a greater extent than do most existing materials the three basic elements of environmental education: natural science, social science, and values. More materials are also needed for early elementary grades, K–3, with sound content and suitability for poor readers. Despite the importance of slums and ghettos as a part of the environmental problem, there is a shortage of good materials for ghetto children, especially those that will enhance the children's self-image and feelings of efficacy.

More films, games, and simulation devices should be included in environmental programs, and sources of these materials are available in the ERIC/SMEAC Resource Lists mentioned earlier.

More materials oriented to involvement and action by students are needed. (Many programs that are exclusively or primarily science education or outdoor education are action-oriented, but in many cases these do not provide social science experiences which are needed.)

Despite the generally recognized importance of the concepts of systems, interdependence, and interaction in environmental science, such concepts receive inadequate attention in most of the social science materials. Materials which explain and make use of these concepts are needed.

Although much of the concern about environmental problems centers on values and life styles thought to be inappropriate, there is a marked deficiency of materials which deal with these subjects. Materials which deal with values and life styles directly, and which incorporate the appropriate concepts in problems studies and activities undertaken, are much needed.

Based on an analysis of effective programs, several recommendations regarding their implementation at the local school level can be made. After identifying your objectives, you should:

- Check to determine if your State has prepared a State environmental education plan. If it has, obtain a copy to become informed about what is planned and determine how your school program relates to the State plan. Phone or write your State environmental education coordinator indicating that

you are planning or have a program you want to develop further, and request assistance.

- Identify, if possible, an existing successful program similar to the one you want to develop. Obtain materials from it and employ a person, if available, from that project as a consultant to help you plan the development of your program. A person who has had experience with a successful operation can provide you with many helpful suggestions and recommendations. Make a site visit if possible.
- Form a local advisory committee, which should include teachers, students, administrators, interested citizens, and representatives of environment-related government agencies. This committee can identify needs; review materials; and provide advice with respect to procedures, direction, implementation, facilities, and funding. Members of the committee can also assist in identifying and obtaining resources such as sites and facilities for school use.
- Obtain administrative and faculty support for the program concept and cooperation regarding possible modification of the schoolday (blocks of time), use of school or public transportation for field activities, modification of the school campus, etc.
- Analyze resources (facilities, sites, staff, funds available). Use as many existing sites and facilities as possible.
- Establish a general program framework which stresses interdisciplinary concepts and local and regional environments and problems. The program should emphasize student involvement.
- Develop instructional objectives and assessment techniques.
- Plan the instructional program.
- Obtain or develop instructional materials needed. Materials should be interdisciplinary, flexible, and provide for different instructional approaches. If your school personnel has not had experience in this type of activity, consultant help should be obtained. Curriculum development is time-consuming and expensive.
- Provide continuous inservice help for teachers involved in the program.
- Organize a feedback system to provide continual improvement of the program.
- Identify a teacher-leader in each building who would coordinate environmental activities in the building by:

  —Assisting other teachers in interpreting printed material regarding the program.

  —Providing orientation for new instructional staff.

  —Providing leadership for inservice workshops and conferences.

  —Assisting other teachers in selecting and obtaining needed materials (both print and nonprint).

  —Assisting other teachers in utilizing materials, facilities, and school sites.

  —Assisting other teachers and administrators with the organizational arrangements needed to install the program, such as modification of the day, team teaching, etc.

CASE STUDIES

The following case studies describe procedures followed by other persons and school systems in developing and implementing environmental education programs. No single description is likely to be totally sufficient or appropriate to meet the needs of everyone; however, by selecting from among various alternatives, one should gain some useful ideas for dealing with most of the major problems encountered.

If at all possible, a site visit to an operational program is highly worthwhile. A far better understanding can be gained on-site than from simply reading descriptive information. This is particularly true for those programs that are highly process-oriented and have relatively few materials.

Site visits to the programs described here are permitted, and staff members will endeavor to aid visitors in finding solutions to problems. Advance arrangements should, of course, be made.

Case Study

Ann Arbor Public Schools
Ann Arbor, Michigan

Origination

In 1961 a K–12 program in conservation education to be integrated into the existing school curriculum was developed. Ann Arbor was one of the pioneer school systems in school camping. As early as 1933, junior high school teachers were encouraged to integrate field trip experiences into their courses of study. During the 1959–60 school year the local Audubon Society created a nature center on a private parcel of land 9 miles from Ann Arbor. The interest created when one elementary school served as a pilot for bringing classes on guided field trips through this center served as the impetus to open the center to all schools in the system the following year. In 1961 the local Audubon Society suggested that the Ann Arbor Board of Education employ a coordinator to direct and expand the outdoor education program initiated at the nature center. This chain of events resulted in the K–12 program which was ultimately developed.

Underlying Rationale

After surveying publications by widely known authorities and writers in the field of conservation education, the program coordinator identified nine principles to be used in the development of a program in outdoor and conservation education:

1. The conservation program should span the K–12 curriculum, so that conservation understandings can be presented in a logical sequence at the time when the learner is most receptive to the material presented. Isolating conservation as a single course limits the scope of the program and the number of students exposed to conservation understandings.
2. The conservation program (K–12) should provide continuity and progression in the program, so that the understandings developed in one grade would grow and be expanded in subsequent grades.
3. The conservation program (K–12) should link the subject areas that relate most closely to conservation, especially science and social studies, so that both the social and scientific knowledge important in understanding and solving resource problems are properly developed.
4. The conservation program (K–12) should be integrated and correlated with the existing curriculum in a manner that will enhance the instructional goals of the school system.
5. The conservation program should give the learner an opportunity to study community natural resources under natural conditions. This provides certain learning experiences that cannot be duplicated within the school building.
6. The conservation program should stress attitudes and not vocational skills. The most important conservation impact that most urban children will have upon our natural resources will be through their action as community citizens.
7. The conservation program should emphasize local resource problems so that our future community citizens will have the incentive and tools to cope effectively with our current and future resource problems. However, the conservation program should not neglect regional, national, and international resource problems.
8. The conservation program should be handled in such a manner that the learner plays an active role in the learning process. The learner develops attitudes through personal experiences and thinking and not through the presentation of predigested conclusions.
9. The conservation program should provide a comprehensive inservice training program for teachers which would operate throughout the school year and would be directed at helping teachers increase their

NOTE.—Material in this case study was adapted with permission from *Integrating Conservation and Outdoor Education into the Curriculum (K-12)* by William B. Stapp, Minneapolis, Minn.: Burgess Publishing Company, 1965.

understanding, interest, awareness, and teaching skills in conservation.

Procedures

The planning and developmental stages of the program were handled by the program coordinator, who developed the elementary (K–6) phase of the program in nine major stages, as follows:

1. Examined teachers' guides and textbooks in science and social studies for each of the elementary grade levels to become familiar with the purpose, objectives, and general scope and sequence of the programs already existing.
2. Met with the science coordinator and an elementary planning committee (elementary principal and representatives from the lower and upper elementary grades) to work out the most effective plan for integrating the outdoor and conservation education program into the existing curriculum.
3. Examined science and social studies curriculum guides for each of the elementary grades in order to develop themes, understandings, and subunderstandings appropriate for each grade level. Each grade level theme was supported by six understandings with subunderstandings also developed to provide desired continuity and progression in the total program.
4. Developed the structure of the program related to field work, teacher orientation, alternatives in case of inclement weather, and followup activities.
5. Located a resource site appropriate for the development of each grade level theme.
6. Contacted, oriented, and trained a group of assistant field trip guides. Guides came from the community and the university student population.
7. Oriented the secretaries in the Office of Instruction concerning orientation and field trip appointments and the confirmation of appointments.
8. Developed charts to help prepare the learner for the field trip experience. These charts are used in a classroom presentation prior to the field trip.
9. Prepared materials and developed an inservice program to orient the teachers for the field trip to the resource site and followup activities.

The development of the secondary phase of the program followed a similar procedure and was also divided into nine major stages. In the fourth major stage, the program coordinator met with junior and senior high school science teachers to discuss ways in which he could provide consultant help to them. The science teachers were asked to list conservation topics for which they would like to have assistance in integrating into their courses. A similar meeting was held, in stage six, with the social studies teachers.

In stages seven and eight, subject material on the conservation topics requested by teachers was developed and mimeographed for distribution to them. In addition a series of approximately 25 Kodachrome slides was developed for use with the classroom presentation of the topics. The ninth stage was the development of an inservice program for the teachers.

Resources

The nature center area was contributed by the local Audubon Society. Two of the resource sites chosen for the elementary phase of the program were controlled by the Board of Education. Additional sites were identified with the help of the district forester and local soil conservation service.

Financing

Financing was apparently handled by the Ann Arbor Board of Education with contributions, such as the land for the nature center, being made available to the schools through interested community and citizen groups.

Materials

No materials were developed for publication other than the book *Integrating Conservation and Outdoor Education into the Curriculum (K–12)* by William B. Stapp.

Evaluation

An evaluation of the program was made at the end of the first year of operation of the elementary and secondary phases. The evalua-

tion consisted of two parts: (1) an open-ended qualitative evaluation in which administrators and classroom teachers were asked to recall and record, in brief statements, those features of the program most helpful in approaching the instructional goals of the Ann Arbor School System; and (2) a quantitative evaluation in which teachers (elementary and secondary) were asked to respond to a series of questions concerning the degree of helpfulness of certain aspects of the program.

Teachers were also asked to respond to three additional questions: (1) what new kinds of attitudes and interests developed in the students as a result of the program, (2) how had the program helped the individual classroom teacher, and (3) were there suggestions for improving the conservation program.

Analysis of the qualitative evaluation revealed that the program was very helpful in (1) approaching the instructional goals of the Ann Arbor Public School System; (2) helping to develop desirable interests, attitudes, and appreciations at all grade levels; (3) helping to develop desirable conservation understandings and concepts at all grade levels; and (4) helping teachers to be more effective in the presentation of conservation material.

Analysis of the quantitative evaluation revealed that elementary teachers rated the program high in:

Approaching their instructional goals.

The degree of helpfulness of the outdoor and conservation education written material in approaching their instructional goals.

The degree of helpfulness of the orientation period in preparing their students for the field trip.

The degree of helpfulness of the presentation on the school bus in preparing their students for the field trip.

The degree of helpfulness of the continuing activities in extending the interest and attitude of their students.

(For kindergarten) Establishing a "friendly" relationship between the child and the living world.

(For first grade) Increasing the child's awareness of his environment.

(For second grade) Increasing the child's understanding of the interrelationship between plants, animals, and soil.

(For third grade) Increasing the child's understanding of the interrelationship between aquatic plants and animals and their nonliving environment.

(For fourth grade) Increasing the child's understanding and appreciation of the interrelationship and interdependence between plants, animals, soil, and water.

(For fifth grade) Increasing the student's understanding of man's impact on the environment.

(For sixth grade) Increasing the student's understanding of how land management practices in a watershed influence the welfare of all people living in the watershed.

Secondary science and social studies teachers rated the program high in:

Approaching their instructional goals.

The degree of helpfulness of the conservation education written material in approaching the instructional goals of their course.

The degree of helpfulness of the program coordinator's classroom presentation in approaching their instructional goals.

Teacher Education

The program of inservice education that accompanies the Outdoor and Conservation Education Program of the Ann Arbor Schools operates throughout the school year. It is aimed at helping teachers increase their understanding, interest, awareness, and teaching skills; and provides teachers with an "Outdoor and Conservation Education Program Guide" containing the philosophy, organization, and operation of the program, and informs the teachers of the procedure for making a class appointment.

Teachers' kits, prepared for each grade level, are sent to a classroom teacher 1 week prior to the class orientation session for the field trip. The kit contains material designed to (1) broaden the teacher's background, (2) prepare the class for the program, and (3) extend the child's learning experience following the field trip.

During the school year a series of grade-level field trips are conducted to orient the

elementary teachers to the resource sites. Additional inservice training sessions are also provided in the form of interlevel presentations and in the preparation and distribution of outdoor and conservation education material.

The inservice program for secondary school science and social studies teachers consists of classroom and field trip presentations and the preparation and distribution of additional conservation material.

Case Study

Environmental Education Program
Madison, Wisconsin

The program presently operating originated as a result of the consolidation of many concepts concerning environmental education and effective learning experiences suggested by Madison teachers. The Wisconsin Department of Natural Resources, the Wisconsin State Department of Public Instruction and more than 500 Madison staff members gave aid and counsel in the preparation of present guides and programs. Curriculum materials previously prepared by the Madison Public Schools and current trends expressed in textbooks, courses of studies, manuals, and professional literature were also utilized.

Rationale

The underlying rationale for the program can best be represented from worksheets prepared by the teachers expressing the following generalizations:

- Each teacher is responsible for assisting pupils to gain desirable concepts in environmental educational.
- Children must be made aware that our way of living depends upon how we use and conserve our natural resources.
- Conservation and environmental education must be integrated with all subjects, yet with some areas taught independently as environmental concepts.
- Concept formation in environmental education occurs when pupils develop understanding, attitudes, and interests which make concepts become positive values.
- Many of the learning activity concepts suggested in the program are further developed by using Madison School Forest facilities and Cherokee Outdoor Education facilities for practical experiences.

Development

During developmental stages of the elementary program, 500 elementary teachers were involved in preparing a *Guide to Environmental Education: Conservation of Natural Resources.* A summer committee wrote the guide which was completed in 1970 for use at the elementary level. Teachers, administrators, and Department of Public Instruction personnel collaborated at all levels—elementary, middle and senior high school—to develop course structures and implementation strategies.

At the high school level, social studies and science teachers were released from teaching responsibilities during the school year to develop the program. Teachers of these two disciplines along with interested students from the high schools met under the auspices of the Department of Curriculum Development to plan course content, concept development, methodology, and implementation strategies. As a result of these efforts, courses in the senior high school have been partially implemented for eco-civics and ecology action programs.

At the middle school level, a similar committee composed of social studies and science personnel again looked at interdisciplining the curriculum at the seventh-grade level using a geography and environmental thrust. This program is continually developing and at presently anticipated rates should be completely implemented within 2 years. A committee for the elementary program and an environmental education committee has met regularly to review materials and discuss the program. These committees continue to function.

Maintenance of the program is aided by provision for 28 part-time naturalists, a Director of the Cherokee Outdoor Education Area, a Director of the Madison School Forest, and Curriculum Department support. It is anticipated that additional administrative personnel will be added in the near future.

Program

The pleasure of responding to a natural environment and the growing awareness and understanding fostered by teacher and naturalist are made available to thousands of Madison children each year through the School Forest

program. Naturalists and buses provided by the Board of Education are just one part of the program, which has been continually growing since its inception a decade ago. At that time, a gift of land was made to the Madison Board of Education—160 acres of virtually undisturbed oak woods. (Since that time an additional gift has increased the area to nearly 300 acres).

Work-Learn Program

Committed to the idea that the best place to teach conservation is outdoors, the director organized a summer "Work-Learn" program for ninth-grade boys. These boys ("too old to play all summer but too young to get jobs") do stream improvement work on area trout streams—fencing, stream structures to direct flow, bank stabilization, etc. This work involves cooperation with the farmer owners and the Wisconsin Department of Natural Resources. Forestry practices are added to these experiences. The new gift of land provided an excellent opportunity, and approximately 80 acres of the Forest were set aside for this purpose. Here, closely supervised by teachers recruited for summer work, the boys learn some basic forestry principles. The lumber harvested is used by the boys to build structures needed for the other facets of the growing School Forest program. As each part of the program has developed, support from the Board of Education, plus occasional additional funds from local businessmen have been obtained.

School Camping

In a hilltop area set aside from school camping, the work-learn boys have built a shelter house, food preparation and utility building, four insulated and heated cabins to accommodate 15 to 20 cots each, and a large nature center. The buildings are located along the edge of a large mowed field suitable for active sports. Here in spring and fall two classes at a time, usually fifth or sixth grade, can spend one or two nights. Each camping group plans its own schedule—including learning expectations, recreational activities, campfire programs, food, individual chores, etc. Naturalists are provided for approximately 3 hours each afternoon, two per class, to lead exploratory hikes and special studies of such topics as mammals, birds, or geology. The camping experience has been very successful, and reservations fill the entire season well in advance.

Adjacent to the campground a picturesque rocky area is available for family picnicking, with picnic tables provided by the work-learn boys. The camping, picnicking, and forestry areas were modified for man's use; man's role for the rest of the Forest is limited to that of preserver and observer.

Interpretive Program

An interpretive program was launched for children of all ages. Each year the following have been offered:

- An evening course in ecology entitled "Reading the Landscape" is held once a week for 12 weeks plus field trips. Made available to the public through the Madison Area Technical College, this course has reached hundreds of people in the area. To encourage teachers to participate, salary advancement credits are given to those completing the course. The course has also provided an opportunity to recruit potential naturalist guides from the ranks of homemakers with a variety of educational backgrounds. (Graduate students at the University of Wisconsin also serve as naturalists, and more recently high school biology honor students have worked with the camping groups.)

- A week-long School Forest Institute in June is a concentrated outdoor learning experience for teachers. The enrollment in this course has increased so much that several experienced guides now assist with the instruction. The course is sponsored by the Board of Education. Fees charged pay for the instructors' salaries. Advancement credits are given.

- Training for naturalist guides was originally done on an information-on-the-trail basis. The need for guides for various outdoor programs in the Madison area has increased so tremendously that a cooperative training program has been set up with the University of Wisconsin Arboretum. (The School Forest presently employs 12 part-time guides.) The

once-weekly morning sessions include lectures and lab-type activities, occasional guest speakers from the university faculty, seminar studies prepared and presented by the guides themselves, outdoor study of various natural communities, and field trips to places of special ecological interest.

Instructional Materials

High quality materials have been developed to aid the classroom teacher. Examples of these include:

- A comprehensive 150-page book on the School Forest, a text for adults on the ecology of the oak forests of Southern Wisconsin.
- An illustrated eight-page booklet "What Is a Tour Through the Madison School Forest?" which summarizes briefly some of the learning experiences possible on the trail.
- Two instructional sets which include filmstrips and guidebooks for classroom use: "Three Layers of Green in the Madison School Forest" for upper elementary, and "Madison School Forest: Clues to the Past Signs of the Future" for middle school. These sets were developed as part of a local material project funded under ESEA title III.

Looking Toward the Future

A program maintains its vitality through continual growth and improvement. Future plans for the School Forest include beginning a summer camping program, and developing guidelines and materials for individual grade level experiences at the Forest. Coordination with programs at other sites in the area will be important. Recently the Madison Parks Department acquired 800 acres in a wetland known as Cherokee Marsh, and through a cooperative arrangement between the Parks Department and the Board of Education an outdoor education program has been started there. In addition efforts will be made to identify an area within walking distance of each school suitable for outdoor education. Having such areas available would encourage more frequent and impromptu investigations of particular topics and would provide a valuable supplement to the School Forest program. The Parks Department is interested in cooperating in this effort.

Evaluation

Constant feedback and input are solicited from staff and students. Records of usage are kept and analyzed. A comprehensive survey of present practice was conducted in 1971 from a randomly selected sample of all levels of 1,700 teachers in Madison. The survey was sponsored by the Madison Department of Curriculum Development, Department of School Community Recreation, Local Materials Development, City Parks Commission, and University of Wisconsin conservation classes. This information has proved valuable for future planning and scheduling.

Case Study

Environmental Science Center
Golden Valley, Minnesota

Origination

The Environmental Science Center was initially funded in 1967 by a 3-year grant from the U.S. Office of Education under the auspices of title III of the Elementary and Secondary Education Act of 1965 (PL 89–10) to develop and implement programs in environmental education aimed at maintaining an environmental balance.

Underlying Rationale

The Minnesota Environmental Science Foundation has, through the Environmental Science Center, set out to provide citizens, both young and old, with:

- An ecological awareness—a concern for their total environment
- An economic awareness—a feeling for how costs relate to today's ecological problems
- A political awareness—an understanding of their individual roles as they relate to collective responsibility
- A problem analysis awareness—the ability to define resource problems, bringing to bear all facets of the situation and all points of view relating to it
- A realization that man is a part of, not apart from, nature
- Some grounding in the dynamics of communication between men and groups.

Inherent in all aspects of the Environmental Science Center's programs is a desire to develop in its participants an "ecological conscience."

Toward this end, the center actively pursues the development and implementation of:

- Innovative and instructional materials
- Comprehensive inservice training programs and workshops in the environmental sciences for elementary and secondary school teachers, administrators, and youth and adult organization leaders
- Identification, development, and utilization of available natural and urban areas and other community resources as environmental learning laboratories
- Programs to provide for community education stressing environmental quality and ecological balance.

Personnel

During the planning stages of the program, the project was headed by the principal of the Golden Valley Middle School with the assistance of the chairman of the science department and an elementary school teacher from the Golden Valley Public Schools. They utilized the services of a variety of resource individuals, such as teachers from other metropolitan school districts; university and college professors, both in the hard sciences and education; agency people from the Department of Natural Resources, Department of Education, U.S. Forest Service, Soil and Conservation Service; personnel from the National Science Foundation-sponsored curriculum projects such as the MINNEMAST program at the University of Minnesota, The Bel Museum of Natural History, the St. Paul Science Museum; and members of the Minnesota Academy of Science. No changes were made in the personnel during the development stages of the project.

Upon notification of the grant award, the chairman of the planning phase of the project immediately sought a director for the project. The director, in turn, sought out the basic personnel needed to begin the planning and development of the implementation phase of the project. The background of these individuals consisted of a former science consultant from the State of Minnesota, a former director and staff member of the MINNEMAST program at the University of Minnesota, an educator/ecologist, a recent college graduate with a major in secondary biology teaching, an elementary teacher, and a junior high school teacher. It should be noted that most of these individuals had previous experience in working

with the National Science Foundation curriculum improvement programs.

The basic staff employed for the initial phases of implementation of the program still remain with the project. In addition, additional personnel with various backgrounds and expertise have been employed either on an interim or long-term basis to complement and supplement those needs for which the existent staff were not able to provide. The number of staff over the years has varied from five to the present level of 25 staff members.

Resources

Generally speaking, no special facilities were needed to implement the program of the Environmental Science Center; rather it was intended to capitalize on those classroom and local settings that would lend themselves to a program aimed at acquiring an understanding of socioecological interrelationships.

Financing

It was discovered early in the implementation phase that the local school districts, utilizing the services of the Environmental Science Center, would not be able to provide long-term support for the center. Further, it was found that support from the legislature would not be easy in coming. The reasons for this were many, but among those most paramount were the escalating costs of education, building funds, salaries, and services.

Through the Minnesota Environmental Sciences Foundation, the center was able to extend its program offering and to continue in existence. The Foundation, with its tax-exempt, tax-deductible status, was able to solicit from local business, industry, individuals and organizations, funding that would provide long-term support of the project. With this favorable tax status it also became eligible to seek other grant awards by Federal and State agencies. In addition, the center levied certain at-cost fees for its programs, workshops, publications, and consultative services.

Materials

Over 50 pieces of curriculum material have been developed by the center. Most were developed to satisfy needs expressed by teachers taking part in the inservice program sponsored by the center, or to satisfy teaching needs identified by the staff. All materials have been designed to cause children to become active participants in the exploration and the study of their environment.

Curriculum materials developed by the Environmental Science Center have been distributed through various means. Most importantly, the teacher and adult participants in the programs have been the primary users of the materials developed. Also, through advertising in the center's newsletter, over 50,000 pieces of curriculum materials have been sold or distributed throughout the State, country, and the world. More recently, the National Wildlife Federation has undertaken the task of publishing 36 of the units of materials for sale through its national office in Washington, D.C.

Evaluation

The objectives of the Environmental Science Center evaluation program are to determine (1) the effect of the center inservice courses upon participants; and (2) the identity and number of persons served. Of particular concern is objective number (1), since inservice participants are principal disseminators of the center's output. Accordingly, the following instruments have been used to assess the degree to which the following anticipated inservice course outcomes are realized:

- A semantic differential test was used to measure changes in attitude toward environmental education and an inquiry strategy for teaching. The test was given under preimposed course conditions.
- An implementation survey to determine: how many inservice participants had actually used center curriculum materials, and which pieces were used most frequently. Response data indicate over 75 percent of all course participants have implemented an average of two curriculum pieces.
- An opinion survey to determine participant acceptance of the workshop environment and its interpersonal elements. The results indicate that from a list of positively and

negatively stated items respondents showed a strong tendency to agree with positive statements. These findings indicate the workshop atmosphere and interpersonal elements were received favorably by participants.

More recently, with the receipt of additional Federal funding, the center has found it necessary to employ the services of an evaluation team to evaluate specifically those programs for which funds were granted. The results of the various forms of evaluation are, and will be, implemented to improve the efficiency of program management and program development, and to provide a baseline for determining the accomplishment of long and short-term goals and objectives of the program.

Teacher Education

A variety of teacher education programs have been developed and implemented during the tenure of the project. Examples are: (1) workshops and inservice programs for teachers, youth leaders, and resource managers; (2) seminars and short courses related to environmental problem-solving; (3) natural area development and utilization studies; and (4) community environmental resources inventory programs and environmental leadership training program. These programs were conducted by the center, either individually or in cooperation with institutions of higher learning and organizations concerned with environmental quality.

Recommendations for Program Development, Initiation and Maintenance

Any program, if it is to be successful, must capitalize fully upon the expertise, experience, and intutition of the staff, community leaders, students, program participants, and agency personnel. Their input must be solicited and considered during early developmental stages of all programs and their unique abilities utilized to implement the program when feasible. Long-term program funding requires extensive planning and management. This process must begin very early in the project and should remain flexible enough to adapt to changes in the economy of the time.

Evaluation must be planned in conjunction with the establishment of the goals and objectives of the project. It must be designed to do more than just provide statistical verification; it should provide the basis for improvement, modification, and alternatives in accomplishing the mission of the program.

Case Study

A K-12 Program
Yarmouth, Maine

In 1966, prior to the popularity of "ecology" and the public outcry against pollution, the small coastal community of Yarmouth, Maine, took its first step in the direction of what was then commonly known as conservation education.

I [Bennett] was fortunate to receive a Leadership Development Fellowship from the Ford Foundation, the purpose of which was to provide a year of study, travel, and internship in environmental education to enable me to return to my community and establish a program. The fellowship sponsors arranged for me to attend the University of Michigan and work in the conservation education program in the Ann Arbor Public Schools with Dr. William B. Stapp as my adviser. During the year I maintained close contact with the school administration in Yarmouth regarding plans to establish a program there the following year. Upon my return to Maine, the community, with a total student population of about 1,200, hired me as a fulltime coordinator to plan and implement a pilot K–12 environmental education program, to be financed by local funds.

The initial idea and support for the program was generated from within the school system, involving both the teaching staff and the administration. Throughout the planning phase, from the program's conception to its implementation, close communications were maintained between all parties. The budgetary details, in particular, were planned at least a year in advance.

Another important first step in the implementation strategy was an all-day workshop for all teachers in the school system at the beginning of the school year. The purpose of the meeting was to thoroughly acquaint all elementary and secondary teachers with the concept of environmental education, since the interest, confidence, and commitment of teachers are essential for the success of any educational endeavor. This meeting did more to secure the initial support of teachers than any other single event. Because this approach was successfully used twice, a brief description may be usefully given here.

In addition to teachers and administrative personnel, town officials, key citizens from community organizations, superintendents from neighboring school systems, representatives from nearby colleges, and correspondents from the local news media were invited to attend the workshop. The meeting itself was carefully organized. Dr. Stapp gave the keynote address describing the concept of environmental education. A slide-tape presentation by the Natural Resources Council of Maine emphasized environmental problems in the State to accent the need for environmental improvement. The chairman of the local planning board then gave a short illustrated talk on the role of the citizen in helping the community to solve environmental problems. This was followed by Yarmouth's town manager who highlighted some of the specific problems facing the community. In the afternoon session I presented with slides the direction the pilot environmental education program might take to help youth to better understand the community's problems and help resolve them. Then all secondary teachers participated in a typical environmental education field trip, traveling through the community aboard a bus. Throughout the trip interesting aspects of the community's history, its geology and natural resources, and its environmental problems were observed and discussed. At the same time all elementary teachers were given practical techniques for using the school site as an environmental learning resource. A final summary session concluded the workshop. All teachers were asked to complete a brief questionnaire on how they felt their subject areas or classes could best contribute to the objectives of environmental education.

NOTE.—Adapted by permission from: "A K-12 Program in Maine," by Dean B. Bennett, in *Processes for a Quality Environment,* Robert S. Cook and George T. O'Hearn, editors, Green Bay: The University of Wisconsin, 1970.

The Community is the Classroom

This kind of meeting is but one of many steps which are necessary to keep the school and lay public informed and involved with a program of interest to both. The community is, indeed, the classroom for environmental education. It is in this area of community and regional environmental studies that environmental education can make its most significant contribution to the total education of youth. And it is through this kind of orientation that opportunities are presented for drawing together the school and community.

Communication is a vital link in the process of implementation and an area which a coordinator must continually explore. Several avenues of communication were pursued. Early in the program (and still continuing) a monthly newsletter was sent to all teachers, administrators, and school personnel, including secretaries, custodians, bus drivers, teacher aides, community program volunteers, town officials, and many others. Also early in the program I met with the town manager, planning board chairman, and other officials to learn more about the community and to acquaint them with the program. Television, radio, and newspaper coverage were relatively easy to obtain due to the action-oriented learning activities youngsters were engaged in. As coordinator, I had many opportunities to speak to local organizations. Slides of the program were very useful in this respect. Many members of these groups subsequently became involved in the program. Over a dozen volunteers were trained to lead field trips. A school site steering committee was formed, which included several community members, to develop a 60-acre site in the center of town as an outdoor learning and recreation area. Two local organizations contributed scholarships to students and teachers for attendance at summer conservation camps. As coordinator, I worked with them helping to select candidates. Other groups became interested in beautifying the school sites; and through the environmental education program, arrangements were made and supervision provided for student involvement in planning activities. Environmental education programs should encourage community involvement from the very conception of a program.

Following the introductory workshop meeting, the program structure and guidelines for its implementation were developed. Three broad areas of work were identified: (1) curriculum development and enrichment, (2) school site development, and (3) dissemination and public relations. Work was commenced in all three of these areas, and each is described briefly below.

Curriculum development and enrichment were begun immediately. It was recognized at the outset that environmental education is not a separate discipline but should be a part of all subjects. It was also felt that successful implementation of a program depends upon its being logical, easily understood, and capable of being readily integrated into the curriculum.

As a starting point, the program accepted the definition that environmental education is an emphasis in education which aims to develop citizens who will have an understanding of their biophysical environment and associated problems, who will possess a knowledge of how they can help resolve problems, and who will be motivated to seek solutions (Stapp et al., 1969). From this definition it was clear that the program should be organized to develop attitudes and behavior. An attitude was defined as consisting of three components: (1) cognitive or knowledge, (2) affective or feeling, and (3) action tendency or readiness to act (Katz, 1960).

On the affective side, three attitudes were identified which were considered important to be developed through the program: (1) individual worth—the idea of a self-image, (2) environmental sensitivity—the idea of a land ethic, and (3) social responsibility—the idea that one must work with others for the benefit of not only oneself but also of others and future generations.

On the cognitive side, six basic concepts were identified. Three dealt with the natural environment: (1) components of the environment differ in individual character, (2) they are interrelated, and (3) they are changing. Three more concepts dealt with man and his environment: (1) man is dependent upon his environment and affected by it, (2) man can alter his environment through institutional and technological systems, and (3) environmental problems result from neutral and man-made forces. These con-

cepts were in turn broken down into subconcepts. They formed an important conceptual framework upon which the program could be developed and integrated into the existing curriculum. It might be pointed out that the first three concepts are strongly related to the natural sciences and the latter three to the social sciences.

The concepts were related to 12 themes, six of which represent elements of the natural environment: land, water, air, plants, animals, and energy. The other six relate to the ways man interacts with his environment: land and water development, structural design, transportation, utilities, recreation, and environmental controls.

A scheme was developed whereby students could be exposed to each of these themes and related concepts at each grade level in an expanding and increasingly complex sequence. At kindergarten and grade one the themes and concepts are related to the school environment, grades two and three—the neighborhood and home, grades four and five—the community, and grade six—the region. In grades seven through 12, the themes become topics for presentation, student investigation, and problem solving within various subject areas. They are centered around not only local problems but also State, national, and international concerns.

At the elementary level, workshops were held at each grade level for citizen volunteers and teachers to introduce them to the themes and concepts and train them to help lead the field trips. The workshops were followed by classroom presentations or field trip orientations, the field trips a few days later, and then followup activities. The field trips were taken, in most instances, partly by bus and partly on foot. The bus was utilized as a moving classroom with audio equipment for questioning, leading discussions, and directing attention to examples of themes and concepts along the way.

Curriculum Enrichment

In addition to the more formal or planned curriculum contact with students and teachers each year, the coordinator enriches the curriculum in a variety of ways: for example, a resource center of teaching materials and educational aids was established; special presentations, assemblies, and field trips were given at all grade levels; individual and group consultations with both students and teachers were carried out; and teacher inservice workshops were conducted.

A second major area of work is school site development to provide opportunities for: (1) student environmental studies and learning experiences, (2) conservation or environmental improvement activities and projects, and (3) depending on the nature of the site, development as a school-community nature center. In Yarmouth a steering committee was formed to develop a master plan for developing a model site. The services of resource agencies, such as the Soil Conservation Service and Maine Forest Service, were tapped. A local landscape architect volunteered to serve as a consultant. A pond was built with funds from several community organizations and the Agricultural Stabilization Conservation Service. Many trees and shrubs have been planted and a nature trail started. A sign has been constructed by the industrial arts department and two Boy Scouts as a merit badge project.

A third area of work involving communications and public relations represents professional activities by the coordinator to expand the influence of the program. Many of these kinds of activities have already been mentioned; several other examples may serve to illustrate the importance of this area.

Early in Yarmouth's pilot program year, a presentation was given at a joint meeting of superintendents and school committee members from neighboring communities. These towns subsequently voted to share costs and participate in the present regional program now serving over 6,000 students in five communities. The cost is less than $4,000 per community per year, making the coordinator approach economically feasible in this situation.

The coordinator approach is perhaps an ideal way to implement environmental education programs in school systems. However, I believe that realistically many if not most school systems, facing rising costs and the pressure of budget cuts, are not likely to adopt this approach. Instead a more feasible plan would

seem to be to establish regional centers. Staffed by trained specialists, these centers could provide direction to teachers and environmental education committees within school systems. The regional coordinator could help plan units and core learning experiences around each school's curriculum. This approach—when augmented by State consultants, college and university undergraduate and graduate programs, inservice courses, workshops, and training programs—could begin to reach a large number of students on a relatively small per-pupil cost basis.

A variety of methods for financing these regional centers should be explored. Centers might, for example, receive financial support from the State educational agency or the State resource agencies or both. Or they might be supported by contributions from several school systems or districts. Perhaps they could be tied to the regional planning office serving the area. Another source of support might be a college or university system. Private sources may also be able to help.

In Maine today such a regionally based program is being developed. Through ESEA title III funding the Maine Environmental Education Project, sponsored by the Yarmouth, Maine, school system, has identified and selected four school systems which have agreed to finance environmental education programs with local funds. The four school systems are located over a wide geographic area of Maine. From each system a teacher has been selected and is currently receiving a year's training in a master's degree program in environmental education at the University of Michigan. Upon the return of these coordinators to their school systems in the fall of 1971, they will implement regional programs.

The Yarmouth area regional program will serve as a model and resource center for these four. Two more school systems and trainees are scheduled to be selected for participation in the project during the next year. These programs, all based upon the coordinator concept, will provide the model programs so necessary if environmental education is to be expanded to other communities.

These programs may eventually become regional centers serving a wide geographic area. In the meantime, the coordinators for these programs will be establishing programs suited to the educational needs of their respective communities and regions.

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Case Study

Regional Marine Science Project
Beaufort, North Carolina

Designing an Integrated Program

Teachers generally choose a certain type of field trip because of availability, ease, proximity, or imitation and then try to warp it to fit a course need. Shortcuts in field trip planning are poor economy. Most require much leg-work, yet justify the effort.

Ideally, field-oriented instruction should be integrated so that a continuity is set up from lower grades to upper levels. Actual continuity will always be more theory than fact, of course, because of turnover in student enrollment, weak links in the teaching, and individual student differences. However, even a hypothetical sequencing of ideas from simple to complex and known to unknown is helpful to teachers. Relating field trips to existing textbooks and grade level requirements will automatically solve much of the problem.

Here is a solid, almost classical, solution for putting marine science in grades 4 through 12.

Grade 4. Studies in *adaptation of individual animals* to the conditions.

Emphasis is not on the evolutionary process but on the variety of adaptation within existing life forms in the sea. A field trip to a salt water aquarium would be ideal, but any natural habitat would be suitable if specimens can be collected and/or observed.

Grade 5. Studies of *community organization,* showing how the variety of adaptations makes it possible for many species to have interrelated roles in a complex web.

Field trip: On the New England or Pacific Coast, tide pools and vertical zonation on rocks would be ideal sites. In coastal Carolina a dredge and trawl are used to bring up life from the bottom of the sound and recreate a picture of the community (oyster bed).

Grade 6. Man's role at the edge of the sea, emphasizing uses of marine resources and human impact on natural communities of coastal areas.

Field trip: a visit to the port terminal (transportation) and a seafood processing plant (sea harvest).

Grade 7. A *survey of local communities,* discussing the variation of environmental factors which give rise to diverse conditions for life.

Field trip: a transect through an offshore island, showing in close proximity an open ocean beach, dunes, maritime forest, shrub thicket, salt marsh, and mud flat.

Grade 8. As part of the earth science course, a study of *coastal processes,* with emphasis on the natural struggle between land, sea, and atmosphere.

Field trip: visit to an open beach to observe waves, longshore current, berm characteristics, and the dynamics of inlet maintenance.

Grade 9. Not included (physical science in the North Carolina system).

Grade 10. In support of the basic biology course of our high schools, the unit emphasizes *ecology* and uses marine habitats to demonstrate.

Field trip: visit to a salt marsh to study the relation of plant and animal distribution to tidal levels and environmental gradients.

Grade 11 and 12. Advanced biology now being broadly desired in high schools, marine science seems an ideal subject in coastal counties.

In the North Carolina project, two courses have evolved. One is a rather tough college prep research-oriented course in marine ecology. The other is a current event-oriented study of local problems of marine resource management, designed primarily for students preparing to work soon in the county rather than going to college.

Field trip: Both courses include extensive field work, the first aimed at giving students experience in individual and team research, the latter course concerned with seeing and doing constructive management projects, and with observing local problems.

NOTE.—Adapted by permission from *Creating Effective Field Experiences For Coastal Schools,* Will Hon and Larry W. Yeater, Regional Marine Science Project, Carteret County Schools, Beaufort, North Carolina, 1970.

While all advanced biology students conduct individual research, there are many opportunities for extra experiences for those with initiative. Students who are willing to put forth extra effort are offered weekend research trips with professional biologists, visits to research facilities, and trips aboard oceanographic research vessels.

Implementing the Program

In this whole scheme, field trips may be considered the culmination of each grade level study, but the classroom remains the arena for most of the unit's instruction. This offers a clue as to how a school system can, with a limited number of marine biologists, put oceanology into many classrooms. A few basic facts, gleaned from experience, are necessary to explain the rationale.

In the first place, it may be assumed that an average or better teacher can take any text materials and do a creditable job of teaching them. If she is also enthusiastic about the subject, her presentation will almost certainly be a success; and if the subject is one of inherent appeal to students, a vigorous learning situation will be created. Marine science usually has all of these things going for it in the classroom. Even a teacher who is generally weak may find that oceanology is very teachable because of its high interest nature, and the unenthusiastic teacher may find herself swept along by natural class interest. Therefore, marine science stands a good chance of being successful when taught by regular classroom teachers if they are given appropriate materials.

The second fact to consider is that the best of teachers seem to fall apart in the field. One can speculate that the approaches demanded by classroom and salt marsh are too different, that both teacher and students have a rigorous in-class relationship which is difficult to alter, and that the novelty and the desire to "get out" obscure the field trip's real potentials. It is not likely that one classroom teacher in 20 can set up a field trip to satisfy an evaluator. Followup of full-week inservice training for enthusiastic school teachers shows that only about 15 percent consistently use field trips in the years ahead, in spite of their sincere expectations.

The reasons why teachers don't conduct trips are many: logistics of transportation, permission slips, liability, and obtaining a site; scheduling problems; administrative disapproval; added responsibilities; and reluctance to experiment. Many of the reasons are valid and very real, but the chief one is often psychological—lack of confidence. It does take a leader with much environment-specific knowledge to conduct most kinds of field trips superbly, but creditable trips could be conducted by average teachers properly inspired. The type of student discovery trip described later in this paper has many possibilities for the nonbiology major serving as trip leader. However, the results of efforts to get masses of teachers to conduct effective field trips are discouraging. In summary, you cannot expect your elementary teachers to carry out extensive field trip programs, and even upper-level science teachers will need constant bolstering.

Combining these two facts, one can arrive at a feasible approach:

1. Let subject matter experts design curriculum units which relate closely to local environments.
2. Prepare teachers as well as is practical in the use of units, but don't be dismayed by loopholes in your inservice training.
3. Let classroom teachers present the 3-week units as best they can.
4. Have field specialists conduct a field trip for each class.

This final step assures that each student will get an expertly guided look at the real environment and will not be too misinformed even if he happened to have a poor classroom teacher. The student will have a written unit for basic information, an inspiring field trip for attitude orientation, and usually a fair 3-week discussion of the environment in layman's (the teacher's) terms.

If this scheme of 3-week units is adopted, the following steps (with suggested limits of practicality) would seem logical:

1. Get administrative endorsement from the top down. Reluctant principals are a constant deterrent to extensive field trip use. It is often overlooked that many principals who talk of

wanting field trips really mean that a couple each year are okay, but they don't want it to be contagious. A clear-cut statement from the county superintendent about the magnitude of the field trip campaign may help really aggressive teachers to get what they need: help and encouragement.

Closely tied to general approval are the logistical problems. Most can be handled with cooperation, but transportation is difficult. Administrative approval should include money and approval for using school buses. There are unforeseen problems here, such as maintenance crews having difficulty fueling busses which are not on the parking lot during their scheduled service stops. Teachers should not be required to fight these problems individually, nor should they be expected to use parent-driven cars. It is poor economy and not a long-term solution anyway.

Achieving all of these things is tricky. Try to get a master plan adopted for the school system, but remember that principals will still be the keys to success. How about a Friday-Saturday workshop in which principals will either observe or themselves be a field trip class, conducted by the best leaders within your reach? Carefully plan everything for their comfort.

2. Put a staff to work designing the overall plan and individual units. You can hire marine biologists, have teachers critique for grade level, and then edit extensively; or you can hire writers, have marine biologists and teachers as consultants, and edit a bit less. Both systems depent on personalities too much for generalizations. Don't hire teachers to moonlight the work, since the job is bigger than anyone will assume, time is critical, and the odds are against a good product anyway. Although a curriculum specialist can sit down and bang out some superficially good-looking material in a few weeks, allow 3 months for preparation of a 3-week unit. Then pilot test it on a few classes and present it to an inservice training session and revise it. An additional revision will be desirable after a year's use in the system. An experienced curriculum developer will do well to produce three units a year, and even a knowledgeable neophyte will have trouble getting out two.

3. Begin inservice training as soon as possible, using the master plan even before units are finished. Split teachers, giving background material suitable for elementary teachers in perhaps three Saturday mornings of ecology-appreciation field trips; and for the secondary science teachers conduct a more subject matter-oriented session.

As units are completed, have grade level 1-day workshops, which should probably be voluntary. Common sense prevails over zeal here, indicating that forced compliance will breed only trouble. When the time comes for units to be taught and field trips to be arranged, would you like to be the teacher who tells her class that they will not participate? There is much in your favor, and over the years you will win over many dissenters—and lose a few supporters who find that field trips aren't what they thought.

4. Introduce marine science as a new high-interest subject which teaches basic principles of biology, ties in with other subjects, and receives a maximum of central office help to bolster the teacher's own efforts.

5. Document all of your activities and results, maintain evaluation procedures, and use the avenues of publicity which will open up to you because of the glamourous nature of your project—boats, gulls, laughing children, wriggling sea creatures, and squealing girls.

Brief Descriptions of Selected Programs, Projects, and Materials

The following environmental education programs, projects, and materials, listed alphabetically by title, have been identified as being worthy of consideration by persons interested in developing or implementing some type of environmental education in their schools. Both science and social science education materials are included in the collection.

AIR POLLUTION, WATER POLLUTION, AND NOISE POLLUTION

Addison-Wesley Publishing Company, Inc.
Menlo Park, California

Authors:	Charles W. Lavaroni, Patrick A. O'Donnell, and Lawrence A. Lindberg
Consultant:	Milton Feldstein, Director of Technical Services Bay Area Air Pollution Control District San Francisco, California
Publisher:	Addison-Wesley Publishing Company, Inc. Menlo Park, Calif.—Reading, Mass.
Publication Date:	1971
Availability:	From publisher
Grade Levels:	Grades 7-9
Subject Area:	Science

Overview

This is a set of three booklets written for students with suggestions to teachers. Designed to help teachers guide the development of ideas, skills, attitudes, and processes of scientists and science in junior high school students, these booklets present information and suggested activities for the study of pollution problems.

Required or Suggested Time

No time specifications are indicated. Each of the booklets provides sufficient information and activities to be used for a period of weeks, if sufficient student interest develops.

Intended User Characteristics

The materials do not appear to have been designed for any specific junior high school student population. Although they are aimed at the junior high school level, these materials could also be used with upper elementary school classes.

Rationale and General Objectives

These materials are designed to promote the development of the scientific enterprise in junior high school students while also making them aware of pollution problems in their environment.

Content

Each of the three booklets is organized into four chapters in the following format. Chapters one and two present the problem to be studied (air pollution, water pollution, or noise pollution) and background information. Chapter three contains suggested student investigations. Chapter four lists additional questions to be answered and supplementary investigations.

Many of the suggested student investigations in the booklets on air pollution and water pollution will be familiar to teachers of general science. The student activities in the noise pollution booklet appear to have been developed or adapted for this area, although some activities, on sound and pitch, come from general science textbooks.

Teaching Strategies

In a page of "notes to the teacher," the authors suggest that the teacher decide upon the most effective use of the booklets. They do present an alternative strategy to that of proceeding through the booklet chapter by chapter: that is, to move immediately to chapter four, using chapters two and three as data sources while the students conduct their investigations.

Materials and Cost

Student materials, with teachers' editions:
Air Pollution, 94 pp., 6½" x 9", stapled paperbound booklet, $1.68.
Water Pollution, 94 pp., 6½" x 9", stapled paperbound booklet, $1.68.
Noise Pollution, 94 pp., 6½" x 9", stapled paperbound booklet, $1.68.

Evaluative Data

None are available at present. The materials have just been put on the market.

ASIAN STUDIES CURRICULUM PROJECT

Asian Studies Inquiry Program
University of California
Berkeley, California

Director:	John U. Michaelis, Professor of Education University of California at Berkeley
Coordinator:	Robin McKeown
Project Address:	School of Education Tolman Hall University of California Berkeley, California 94720
Publisher:	Field Educational Publications, Inc. 609 Mission San Francisco, California 94105
Publication Date:	1969
Availability:	From publisher
Grade Level:	10
Subject Area:	Asian studies

Overview

The Asian Studies Inquiry Program was developed under the auspices of USOE's Project Social Studies. The overall program includes three clusters of materials dealing with the themes "Asian Thought," "Changing Patterns of Asian Life," and "Traditional Patterns of Asian Life." The latter cluster includes two units which deal with man-environment relationship: *Man and His Environment in Asia* and *Food and Survival in Asia.* The total program is designed to help students in developing their own conclusions about Asia, past and present, and is based on well-defined social science concepts, and extensive rationale, and well-stated general objectives. The two environmentally relevant units provide a striking contrast to the traditional American view of man-land relationships.

Required or Suggested Time

Each of the two units is expected to comprise about 1 week's classwork. Individual lessons within each unit booklet can be used separately.

Intended User Characteristics

Since the program is primarily aimed at understanding Asian cultures rather than environmental problems in technologically advanced countries, the teacher must develop specific strategies for tying these readings and discussions to current environmental issues in the U.S., such as water pollution, land use, and resource allocation. This will require a degree of already existing environmental sophistication on the part of the teacher.

Rationale and General Objectives

Rather than memorizing such minutiae as the dynasties of China, a student confronts universal concepts such as the nature of man, progress, man's relation to man, man's relation to nature, and the purpose of government.

General objectives for the program are to provide knowledge of Asian cultural patterns, classroom experience with universal issues and problems illuminating human behavior from a variety of cultural perspectives, use of inquiry skills, and the development of positive attitudes toward Asia and its study.

Content

Man and His Environment in Asia and *Food and Survival in Asia* are part of the third cluster, "Traditional Patterns of Asian Life," which focuses on the relationships between the geography, climate, philosophies, and religions of

Asia and Asian economic, political, and social institutions.

Man and His Environment in Asia is divided into two sections, "Asia's Physical Diversity," and "Asian Man and His Environment." The first contains readings on the effects of monsoons on Indian life, the diversity of culture and geography in Southeast Asia, the Japanese use of the sea, the effects of drought on a Chinese village, and the problems of fully utilizing the Mekong River. The second section includes two readings on irrigation problems in China and Taiwan, one on land reclamation in China, one on a cholera epidemic in the Philippines, and one on village life in India. The concluding questions in the Teacher's Manual are intended to draw out discussion about the strong, but never totally deterministic, influence of geography on cultural patterns in Asia.

Food and Survival in Asia focuses on the relationships among population, culture, and food production in Asia. It is composed of two sections, "The Impact of Hunger and Poverty in Asia" and "The Causes of Hunger and Poverty in Asia." The first section includes several readings on the effects of famines, a description of the style and standard of living in village India, a reading on Chinese communal agriculture, and several readings on urban poverty in Asia. The second section includes readings on the impact of climate on Asian life, the effects of traditional Asian outlooks on progressive economic and technological programs, the various factors discouraging energetic pursuit of agricultural improvement, waste, and the implications of population growth for Asia. The concluding questions in the Teacher's Manual encourage discussion of the effects of poverty and hunger on Asian life, a search for the causes of such conditions, and projections of ways to solve the hunger and poverty problems of Asia.

Teaching Procedures

The general classroom strategy consists of discussions based on the readings. The Teacher's Manual suggests several discussion questions for use with each reading and furnishes a description of an inquiry model which the developers feel is appropriate to reaching the desired student understandings. Students are expected to raise questions of their own and to create ideas and try them out on their classmates. The teacher is restricted to open-ended questions and refrains from giving absolute answers.

Materials and Data

Student Text:

Man and His Environment in Asia. By Christopher L. Salter; 7¼" x 9¾" papercovered booklet; 64 pp., packs of 10, $9.
Food and Survival in Asia. By Robin J. McKeown; 7¼" x 9¾" papercovered booklet; 64 pp., packs of 10, $9.

Teacher's Guide:

Traditional Paterns of Asian Life. 7¼" x 9¾" papercovered booklet; 48 pp., 75 cents.

For information on other materials available in the Asian Studies Inquiry Program, write the publisher.

Evaluative Data

Not available.

BSCS GREEN VERSION: HIGH SCHOOL BIOLOGY

Biological Sciences Study Commission
University of Colorado
Boulder, Colorado

Project Address:	BSCS University of Colorado Boulder, Colorado 80302
Publisher:	Rand McNally and Company
Publication Date:	1968
Availability:	From publisher
Grade Levels:	9-12
Subject Area:	Biology

Overview

Approximately one half of this edition of the BSCS Green Version is devoted to environmental education. Moving from the concrete to

the abstract, from the individual organism to the ecosystem, a background for the study of inter-relationships of organisms is laid. Patterns of life of macroorganisms on land and in the water are examined as are life patterns of microorganisms. The final section focuses on man's role in the interaction of organisms which comprise the web of life. Use of the inquiry approach is prominent throughout.

Required or Suggested Time

The BSCS Green Version is intended as a 1-year course. Although only half of the content is oriented toward environmental education, the skillful teacher could spend more or less time in this area.

Intended User Characteristics

This edition is intended for the middle 60 percent of tenth-grade students but can be easily modified for use in grades 9 through 12. Suggestions for further problems and readings can be adapted for the upper range of students; students in the lower 20 percent of the class would have some difficulty in handling the text material.

Rationale and General Objectives

Recognizing that the great majority of high school students take biology and that this will be the last science course for a large number of students, the BSCS Green version seeks to provide the student with a science background that will be useful to an adult member of society. Encouraging a scientific viewpoint in the student, the text is intended to develop an understanding of the interrelationship of all organisms and particularly man's own place in this interrelationship.

Content

Three sections in this text deal with environmental education—Section One: The World of Life: The Biosphere (Chapters 1-3), Section Three: Patterns in the Biosphere (Chapters 7-10), and Section Six: Man and the Biosphere (Chapters 19 and 20). Much of this material is strictly ecological with environmental problems playing a minor role; however, the final section deals with the effects of man on the environment and the problems that man now faces.

Teaching Procedures

The material is oriented toward scientific inquiry with student investigations inserted at pertinent points in the text. A comprehensive teacher's guide provides background information and suggestions. Class discussions and problem-solving sessions play a major role.

Materials and Cost

Student Text (with lab investigations), $7.35.
Teacher's Guide (with lab investigations), $3.30.

Evaluation Data

Evaluation of the BSCS Project can be obtained through the ERIC Clearinghouse on Science, Mathematics, and Environmental Education, Ohio State University, Columbus, Ohio 43221.

CHICAGO PUBLIC HIGH SCHOOL FOR METROPOLITAN STUDIES

Chicago, Illinois

Principal:	Mr. Nathaniel Blackman, Jr.
Program Address:	Chicago Public High School for Metropolitan Studies 537 Dearborn Street Chicago, Illinois 60605
Grade Level:	Secondary school
Subject Area:	All areas, grades 9-12 (High School without Walls)

Overview

This high school program was modeled after the Philadelphia (Pennsylvania) Parkway Program. The program is multidisciplinary and offers a great variety of learning opportunities.

Rationale and General Objectives

The school is designed to provide students with opportunities to learn throughout the city

and in diverse settings, to permit students to be involved in decisionmaking, to promote student identity, and to provide for close student and teacher contact.

It is also an experimental school to test the hypothesis that this type of school is feasible in Chicago.

Description

The students are selected from all parts of Chicago. They are involved in programs with three major components. One part of the program involves learning experiences in institutions such as museums, city government, and companies. A second portion of the program involves courses such as English taught by staff teachers. The third part of the program involves counseling groups of under 20 students which meet on a regular basis. Planning for programs includes all people involved—students, staff, and institutional groups.

Materials

Materials are being developed, and information regarding them is available from the principal.

Evaluation

Evaluation has been continuous during the project. Reports on planning and operations are available. Changes in the program have resulted from evaluation. Future expansion is planned.

CONCEPTS AND INQUIRY

Educational Research Council of America
Cleveland, Ohio

Director:	Raymond English
Project Address:	Educational Research Council of America Rockefeller Building Cleveland, Ohio 44113
Publisher:	Allyn & Bacon, Inc. 470 Atlantic Avenue Boston, Massachusetts 02210
Publication Date:	Kindergarten-Grade 3, 1970 Grades 4-6, 1971 Grades 7-8, 1972 Grade 9, 1973
Availability:	From publisher
Grade Levels:	K-9; materials for grades 10-12 presently being tested and revised
Subject Area:	Multidisciplinary anthropology, economics, geography, history, political science, psychology, and sociology

Overview

The materials in this social science program are structured around the basic concepts, skills, and learning processes of all the social science disciplines. The program is sequential and cumulative with specific concepts introduced at lower levels and with increasing sophistication as the student progresses. The teacher's guides clearly indicate the general philosophy of the program, discuss the overall objectives, and demonstrate how the individual units fit into the whole. Some of the units are more directly related to areas of environmental concern, but in almost every year's program some attention is paid to concepts which have importance in environmental education.

Required or Suggested Time

Each program is designed as a 1-year course for a particular grade; however, the student materials are not labeled so that they can be used flexibly in an ungraded situation.

Intended User Characteristics

The developers state that, although the program offers a variety of optional materials and activities to reach most student populations, it may not be satisfactory in reaching the needs of students with poor reading skills or from disadvantaged backgrounds. The teacher's guide is clear and explicit enough so that any teacher could implement the course without further training.

Rationale and General Objectives

The educational philosophy of the curriculum emphasizes the transmission of culture and the

analysis of values in human societies through the acquisition of a usable, coherent body of social science skills, knowledge, and attitudes. It is felt that, by exposing students to a discrete body of knowledge and skills, they will be able as adults to make informed decisions in matters affecting them and the world.

Content

Environmentally sound concepts such as *Man and His Environment; The Nature and Importance of Values; Norms and Relativity; The Nature of Man; Specialization; Agriculture, Manufacture, and Services; Cultural Differentiation;* and *The Nature of Law* are considered at all grade levels. Earth sciences in relation to social science and spatial interconnections are taught in grades one through six; and economic growth, social harmony and disharmony, and demography are treated in grades two through six.

Teaching Procedures

The focus of the materials is on inquiry strategy, although they provide for a variety of techniques. Students are encouraged to become actively involved in the learning process and to apply the skills of problem solving.

Evaluative Data

Not available.

Materials and Cost

Kindergarten:

First Semester: Learning About the World

Student Text: none

Teacher's Guide: 267 pp., 8″ x 10″, paperbound, $4.68.

Teacher's Kit: pictorial materials for bulletin board and transparency masters in 8″ x 10″ manila envelope, $1.68.

Second Semester: Children in Other Lands

Student Text: *Children in Other Lands.* 44 pp., 8″ x 10″, paperbound, $1.32.

Teacher's Guide: 275 pp., 8″ x 10″, paperbound; full color photographs and paintings, $4.68.

Teacher's Kit: pictorial materials for bulletin board and duplicator transparency masters in 8″ x 10″ manila envelope, $1.32.

Grade One:

First Semester: Our Country

Student Text: *Our Country.* 75 pp., 8″ x 10″ paperbound, $2.

Teacher's Guide: 435 pp., 8″ x 10″, paperbound, $6.

Second Semester: Explorers and Discoverers

Student Text:

14 texts, each dealing with different explorers, 8″ x 8″, paperbound, each $1.32.

Teacher's Guide: *Explorers and Discoverers. 322 pp.,* 8″ x 8″, paperbound, $6.

Sound filmstrips:

3 sets, each dealing with several explorers, $36 to $45.

Grade Two:

First Semester: Communities at Home and Abroad

Student Text:

3 titles, 134-170 pp. each, 8″ x 10″, paperbound, each $2.

Teacher's Guide: *Communities at Home and Abroad. 367 pp.,* 8″ x 10″, paperbound, $6.

Second Semester: American Communities

Student Text:

An Historical Community: Williamsburg, Virginia. 122 pp., 8″ x 10″, paperbound, $2.

A Military Community: Fort Bragg, North Carolina. 66 pp., 8″ x 10″, paperbound, $1.32.

An Apple-Growing Community: Yakima, Washington. 58 pp., 8″ x 10″, paperbound, $1.32.

A Forest-Products Community: Crossett, Arkansas. 71 pp., 8″ x 10″, paperbound, $1.60.

A Steel-Making Community: Pittsburgh, Pennsylvania. 119 pp., 8″ x 10″, paperbound, $1.80.

A Rural Community: Webster City, Iowa. 162 pp., 8″ x 10″, paperbound, $2.

Teacher's Guide: *American Communities.* 367 pp., 8″ x 10″, paperbound, $6.

Grade Three:

Student Text:

First Semester: *The Making of Anglo-Amer-*

ica. 282 pp., 8″ x 10″, paperbound, $2.56.

Second Semester: *The Metropolitan Community*. 184 pp., 8″ x 10″, paperbound, $1.92.

Teacher's Guide: *The Making of Anglo-America and The Metropolitan Community*. 419 pp., 8″ x 10″, paperbound, for both semesters, $6.

Grade Four:

First Semester:

Student Text: *Agriculture: Man and The Land*. 250 pp., 8″ x 10″, paperbound, $2.25.

Teacher's Guide: *Agriculture: Man and The Land*. 204 pp., 8″ x 10″, paperbound, $2.25.

Second Semester:

Student Text: *Industry: Man and The Machine*. 249 pp., 8″ x 10″, paperbound, $2.55.

The Indian Subcontinent. 124 pp., 8″ x 10″, paperbound, $1.65.

Teacher's Guide: *Industry: Man and The Machine*. 178 pp., 8″ x 10″, paperbound, $1.35.

The Indian Subcontinent. 108 pp., 8″ x 10″, paperbound, $1.50.

Grade Five:

The Human Adventure

Student Texts:

4 student texts, 154-170 pp., 8″ x 10″, paperbound, each $1.92.

Teacher's Guide for each of above; 121-131 pp., 8″ x 10″, paperbound, each $1.35.

Student Text: *Lands of the Middle East*. 157 pp., 8″ x 10″, paperbound, $2.25.

Teacher's Guide: *Lands of the Middle East*. 112 pp., 8″ x 10″, paperbound, $1.50.

Grade Six:

The Human Adventure

Student Texts:

4 student texts, 169-171 pp., 8″ x 10″, paperbound, each $1.98.

Teacher's Guide for each of the above; 98-149 pp., 8″ x 10″, paperbound, each $1.35.

Student Text: *Lands of Latin America*. 186 pp., 8″ x 10″, paperbound, $2.25.

Teacher's Guide: *Lands of Latin America*. 124 pp., 8″ x 10″, paperbound, $1.50.

CONSERVATION AND ENVIRONMENTAL STUDIES CENTER, INC.

Browns Mills, New Jersey

Director:	V. Eugene Vivian
Project Address:	Box 2230, R.D. 2 Browns Mills, New Jersey, 08015
Grade Levels:	Elementary and Junior High School
Subject Areas:	Science, social studies, outdoor education, mathematics, language arts, environmental education

Overview

The Conservation and Environmental Studies Center, Inc. has grown into a regional center for southern New Jersey which provides week-long resident programs for elementary and junior high school students with their teachers, high school student assistants, and college student internes. Most materials developed have been for use with teachers and students in these week-long terms at the center. A few have been developed for use in the regular school situation before or after the resident program at the center.

Rationale and General Objectives

The approach to environmental education is intended to "create a concern for all environments that leads to a commitment to preserve optimum environments and improve less desirable environments." Specific objectives of the program are to (1) develop comprehensive teacher guides and children's tests and activity materials for environmental education, (2) train teachers to use environmental education curriculum materials and develop their own curriculum materials for environmental education,

and (3) conduct exemplary programs for teachers and children in environmental education.

Program Description

There are three major aspects of the program involving the center with schools. *On-Site Programs* are conducted with scheduled visits by center personnel to participating school districts to develop programs within the existing curriculum. Classrooms, school grounds, and areas adjacent to the school property are used. The emphasis is on training teachers rather than on direct classroom teaching.

Day-Trip Environmental Education Programs are designed for classes having a special purpose for visiting the Pine Barrens. These field trips are to reflect an ongoing curricular concern rather than a casual visit. They require a visit to a particular location to witness a seasonal change, observe a unique phenomenon, or contrast the area with areas previously studied.

Resident Environmental Education Programs, conducted at the project center, are usually 5 days in duration. Joint planning by center personnel and teachers takes place prior to arrival at the center. Techniques for evaluation of objectives in the cognitive, affective, and psychomotor domains are also developed during the planning stage.

Teacher education programs, both preservice and inservice, are conducted as part of the program. This includes workshops of 2-3 days, summer institutes, evening classes for graduate credit at Glassboro State College, a course on Science and Environment, and the Headstart Supplementary Training Program. In addition, materials for educators to use in preparing teachers are available and consultant services are provided.

Much of the material developed by CESC understandably concentrates on the local environment of South Central New Jersey: history, ecology, geology and soil, agriculture and forestry, weather, and hydrology. Others deal with perception, language arts, arithmetic, and geometry through field experience. Still others could be used in urban settings almost anywhere.

Of the 16 curriculum areas in the *Teachers Workshop Handbook,* the following fall within the environmental education scope:

Agriculture in the Pine Barren
Animals in the Pine Barren
Environmental Concerns
Exploring an Historic Site
Outdoor Observation Experiences
Pine Barrens Ecology
Public Lands, Development and Protection
Water Quality Study

While they include little analysis of problems, teachers may find the following separate teacher's guides useful:

Founding a New Settlement: Survival Skills
Inviting Involvement with History
The World Around Them: Environmental Education in the Urban Environment
A Cleaner World: Litter and Solid Waste Disposal
Main Street, U.S.A.

Materials

Teachers Workshop Handbook
Teacher's Guides (specific titles listed above)

Evaluative Data

Direct feedback evaluation of an anecdotal kind is requested from teachers and students who use the facilities. Modifications in the program and materials are made on this basis.

CONSERVATION AND OUTDOOR EDUCATION PROGRAM

Ann Arbor, Michigan

Directors:	John Rosemergy William Browning
Project Address:	601 West Stadium Blvd. Ann Arbor, Michigan 48103
Grade Levels:	K-12
Subject Areas:	Science, social studies

Overview

The Ann Arbor Public Schools Program developed from experiences in school camping and outdoor education. In 1960 a nature center was established and opened to the schools. In 1961 a program coordinator was employed to

direct and expand the Outdoor Education Program, which became an Outdoor and Conservation Education Program.

Rationale and General Objectives

The K-12 program was developed to present conservation understandings in a logical sequence at a time when learners are most receptive to the material presented. It is intended to link subject areas, particularly science and social studies, so that both the social and scientific knowledge important in understanding and solving resource problems can be developed. Understandings developed in one grade are expanded in subsequent grades. Attitudes rather than skills are emphasized. The learner plays an active role in the learning process.

Description

The program is integrated within the existing curriculum rather than being separate. It stresses the study of community natural resources under natural conditions. A specific theme together with subunderstandings is established for each grade level. Resource sites are available for developing each grade level theme, and a "Teachers' Kit" aids the teacher in obtaining background information, preparing the class, and extending the children's learning experience following a field trip. Materials can then be selected, adapted, or developed as appropriate. The presentation consists of three phases: orientation, field trip, and followup. Field trip guides aid in interpreting the sites in relation to the grade level theme.

Kodachrome slides, approximately 25 per topic, were prepared for use with each of the conservation topics presented in science and social studies classes as part of the secondary phase of the program.

Inservice programs are conducted for both elementary and secondary school teachers. A series of grade-level field trips for elementary teachers is conducted during the school year. Additional inservice sessions provide interlevel presentations as well as providing opportunities to develop and distribute outdoor and conservation education materials. The inservice program for secondary school science and social studies teachers consists of classroom and field trip presentations as well as the preparation and distribution of additional conservation material.

Materials and Cost

No materials are available as such. However, the development and implementation of the program are described in detail in *Integrating Conservation and Outdoor Education into the Curriculum (K-12)* by William B. Stapp, Burgess Publishing Company, Minneapolis, Minnesota, 55415, publication date 1965.

Evaluative Data

A two-part evaluation was administered at the end of the first year of operation of the elementary and secondary phases of the program. The first part was an open-ended qualitative evaluation in which administrators and classroom teachers were asked to recall and record, in brief statements, those features of the program most helpful in approaching the instructional goals of the Ann Arbor school system. In the quantitative phase of the evaluation, elementary teachers and secondary school science and social studies teachers were asked questions concerning the degree of helpfulness of certain aspects of the program. Data received indicated that elementary teachers as well as the secondary school science and social studies teachers reacted favorably to their experiences.

CONSERVATION CURRICULUM IMPROVEMENT PROJECT

State Department of Education
Columbia, South Carolina

Directors:	Albert H. H. Dorsey, Coordinator Matthew J. Brennan, General Editor
Project Address:	State Department of Education Columbia, South Carolina 29201
Publisher:	J. G. Ferguson Publishing Company 6 North Michigan Avenue Chicago, Illinois 60602

Publication Date: 1969

Availability: From publisher

Grade Levels: 1-12

Subject Areas: Conservation core, economics, geography, history, political science, sociology

Overview

The materials for "People and Their Environment" were prepared by the Conservation Curriculum Improvement Project, administered by the South Carolina Department of Education in cooperation with the School of Education, University of South Carolina, and the South Carolina Advisory Council for Conservation Education, and funded by the Belle W. Baruch Foundation. The materials, which are primarily curriculum guides designed for use by teachers and curriculum workers, suggest an approach to the teaching of conservation as an integral part of various subject matter areas at all levels of education. These teacher's manuals include suggestions for lesson topics, readings, and instructional materials. They are designed to stimulate teachers to improve instructional procedures so as to provide experiences for students which will create interest and concern for interaction with their environment.

Required or Suggested Time

The lessons suggested in these guides are very flexible in time use. They vary from 1 day to activities which can be used throughout the year.

Intended User Characteristics

All of the guides have been designed to supplement existing curriculums in a variety of subject areas from primary through high school grades. Teachers are encouraged to adapt the materials to meet their needs and the needs of their students. Since most lessons are in bare outline form, teachers will have to do considerable work to utilize the "average" lesson.

Rationale and General Objectives

This series of guides provides a program of action—curriculum experiences–which stress the interdependence of all living things with one another and with their environment as the underlying conceptual scheme. The major goal of the materials is man's recognition of his interdependence with all of life and his environment. The guides are designed around three major concepts: (1) living things are interdependent with one another and with their environment, (2) organisms (or populations of organisms) are the product of their heredity and environment, and (3) organisms and environments are in constant change.

Content

The basic purpose of these multidisciplinary materials is conservation or the judicious utilization of resources. The concepts apply equally well for any subject area. The science concept "an organism is the product of its heredity and its environment" becomes "the family or the community is the product of its culture (heredity) and the rules under which it must operate (environment)" in the social studies. The materials become increasingly complex in the upper grade levels.

Teaching Procedures

The teaching strategies outlined in these guides include a wide variety of student activities, learning experiences, and cooperative group work. There are many suggested outside readings for students and audio-visual materials for teachers.

Materials and Cost

Teacher's Curriculum Guide to Conservation Education, Grades 1-2-3: 152 pp., 8" x 12", paperbound, $3.50.

Teacher's Curriculum Guide to Conservation Education, Grades 4-5-6: 177 pp., 8" x 12", paperbound, $3.50.

Teacher's Curriculum Guide to Conservation Education, Grades 7-8-9: 134 pp., 8" x 12", paperbound, $3.50.

Teacher's Curriculum Guide to Conservation Education, Social Studies, Grades 10-11-12: 110 pp., 8" x 12", paperbound, $3.50.

Evaluative Data

Not available.

ECONOMICS IN SOCIETY (Formerly ECON 12)

Coauthors: Suzanne Wiggins Helburn, Associate Professor of Economics, University of Colorado, Denver

John Sperling, Professor of Humanities, San Jose State College, California

Robert Evans, Social Studies Consultant, Sonoma County Department of Education, Santa Rosa, California

Publisher: Addison-Wesley, 2725 Sand Hill Road, Menlo Park, California 94025

Publication Date: Fall 1972

Availability: Final Report: ERIC ED 028 093
Unit I Student and Teacher Materials: ERIC ED 040 100 and ED 040 101

Grade Levels: High school, junior college

Subject Areas: Economics, problems of democracy, American government

Overview

Economics in Society provides student and teacher materials for a one-unit to 1-year economics course. Originally developed as a part of USOE's Project Social Studies, with additional funding by the Joint Council on Economic Education, the authors sought to implement the recommendations of the 1961 National Task Force Report, *Economic Education in the Schools*. Taken together, the materials comprise a teaching system with behaviorally stated objectives and a variety of teaching procedures.

In the course are a number of activities and readings devoted to environmental issues. For example, there are readings from Thomas Malthus, the Conservation and Natural Resources Subcommittee of the Committee on Government Operations, U.S. House of Representatives, and other important documents on natural environment, resource use, pollution, national priorities, and environmentalist value positions.

Required or Suggested Time

Unit I requires from 12 to 18 weeks to complete. Units II, III, and IV can be completed in 4 to 8 weeks each.

Intended User Characteristics

The course is written at the 10th-grade reading level and reading assignments are short. No previous knowledge of economics is necessary, nor are there any other prerequisites. The course was designed specifically to aid inexperienced and inadequately trained teachers of economics. However, teachers with a significant background in the subject will be able to make more imaginative use of the materials. Inservice training in course implementation is useful but not mandatory.

Rationale and General Objectives

The authors believe that economic literacy is essential if an individual is to function usefully in society. Carefully prepared materials can introduce students to the power of economic analysis. The primary emphasis is on learning the skills of economic reasoning and applying them to current public policy issues.

Teaching Procedures

The instructional theory is based on Richard Suchman's thinking-learning model which draws from both field and stimulus-response theory. The use of organizers to select, group, and order experiences is stressed. A variety of suggested teaching strategies and materials is used, depending on the learning objectives to be achieved. Programed instruction, in short units aimed at specific learning tasks, can be pursued at the student's own pace. Other materials provide topics, questions, and problems for class discussion and small group work. Materials are provided for role-playing, survey research, and debates. Some mini-lectures for presentation of new information and for summing-up or setting-up are suggested. There are self-evaluation tests for student use.

Materials and Cost

Materials for the course will include student materials, a teacher's guide, and an inservice

training kit. Cost of these materials has not yet been determined.

Evaluative Data

All project evaluation was formative evaluation—feedback to the development team to help them in making the many curriculum and materials decisions. The project staff did not undertake any summative evaluation.

THE ECONOMICS OF POLLUTION

Joint Council on Economic Education
New York, New York

Authors:	Harold Wolozin, University of Massachusetts at Boston Patricia R. Reilly, John Dewey High School, New York City
Publisher:	Joint Council on Economic Education 1212 Avenue of the Americas New York, New York 10036
Publication Date:	1970
Availability:	From publisher
Grade Levels:	9-12
Subject Area:	Economics

Overview

The Economics of Pollution is one of the pamphlets in the Economic Topic Series published by the Joint Council on Economic Education. Part One examines the economic relationships that help to explain why pollution is a special problem of production and consumption. Part Two surveys the difficulties of measuring and assigning costs. In Part Three measures used to combat pollution are analyzed. Accompanying each part are teaching suggestions for utilizing the information, instructional objectives, ideas for motivating students, strategies for analysis of pertinent questions, and graphic materials for clarifying issues.

Required or Suggested Time

No specific time is suggested by the authors; however, the suggested strategies and activities could be utilized in a period ranging from 1 to several weeks. The material is designed as a plug-in unit in an existing economics or social studies course. Any social studies teacher can successfully implement the materials, although some background in economics would be helpful.

Rationale and General Objectives

Since pollution of the environment is one of the hottest issues of our time, the Joint Council on Economic Education felt it necessary to produce materials which would deal with the economics of pollution. One major question is whether economic growth is possible without proportionate increases in the pollution of our air, land, and water. Since "the quality of our environment is imperiled, our cities may become uninhabitable and our countryside may be irretrievably blighted." Students should be motivated to investigate the problems of pollution.

Content

The authors present in Part One: The Anatomy of Pollution, an introduction to the problems of pollution. They present an overview of the pollution threat by giving information about air pollution, water pollution, and solid waste pollution. In Part Two the question of measuring the costs of pollution is raised with external versus internal costs, external costs and resource allocation, and the relationship between costs and pollution criteria is discussed. Part Three deals with the question, Can pollution be controlled? It examines the political and economic problems which make it difficult to control pollution. The social costs of pollution—the damage to the total community—are explained and new ways suggested for dealing with the problem in the future.

Teaching Procedures

Suggestions for motivating students are offered—"What can be more relevant than their personal survival?" Using quotations from the articles to begin discussion, charting the amount of waste from American homes, filmmaking of problems of the immediate environment, and sound-and-sight presentations all can be used to motivate students. As the authors suggest, "Any departure from the traditional

question and answer method depends on the ability of the students, the availability of equipment and materials, and time allotment for teacher preparation." Discussion questions, teaching models, analysis strategies, special project suggestions, sources of print and visual materials, and suggested readings are all offered as aids for the teacher.

Materials and Cost

The Economics of Pollution. By Harold Wolozin and Patricia R. Reilly. 18 pp., 8½" x 11", stapled paper cover, $1.

Evaluative Data

Not available.

EKISTICS

State Department of Education
Sacramento, California

Director:	Rudolph J. H. Schafer Consultant in Conservation Education
Address:	California State Department of Education State Education Building 721 Capitol Mall Sacramento, California 95814
Grade Levels:	1-12
Subject Area:	Environmental education

Overview

Current developments in the field of environmental education have made it clear to most educators that some basic rethinking and restructuring of the curriculum is in order to help students develop the skills, attitudes and knowledge they will need to participate intelligently in the decisionmaking process concerning the environment and its resources. The State of California is well into such a process, and has prepared a publication titled "Ekistics—A Guide for Conservation and Environmental Studies Curriculum Development" developed under the direction of Dr. Paul Brandwein. The need for the new curriculum guide was officially recognized in 1968 when the California Legislature mandated that "wise use of natural resources and man's relations to his human and natural environment" be taught in appropriate grade levels and subject areas in grades one through twelve in California schools. In 1969, the Report of the Conservation Education Advisory Committee to the State Board of Education recommended that the State Department of Education develop a curriculum outline showing California educators how this legislative mandate could be implemented.

In mid-1970, Brandwein and a carefully selected project team developed a first draft of the publications. This first draft was printed and distributed on a limited basis for review and comment. A final publication version will be produced as soon as possible for printing and distribution by the Department of Education.

The draft version, about 251 pages, includes a statement of rationale, conceptual outlines, explications of the concepts, performance objectives, a discussion of instruction and teaching, and a bibliography.

Rationale, General Objectives, and Descriptions

What behavioral changes are to result from this new curricular approach? "The aim is to produce those changes in human concepts and values," Brandwein states, "which will result in behavior which demonstrates recognition in word and deed by the student that he is interdependent with his environment, and that he supports a culture which sustains a sanative (healthy) environment.' In order to develop these behavioral patterns, Brandwein and his team have developed a conceptual guide for the elementary grades involving three cognitive affective schemes: (1) Man is interdependent with his natural and physical environment; (2) man's social behavior is basic to maintaining, altering, adapting, or destroying the environment; and (3) man utilizes his symbolic and oral traditions to maintain or alter the environment.

In terms of traditional subject matter areas, the areas of (1) science, resource technology, and health, (2) the social sciences, and (3) the arts and humanities are principally con-

cerned. However, there are vast implications for other subject areas, and environmental studies could well become the community of discourse for the entire elementary curriculum.

Moving on to the junior high level, it is suggested that a unit of work based on four cognitive-affective schemes be included in these four curricular areas: (1) social science, (2) science, (3) humanities, and (4) health. Environmental education implications in other subject areas would also be stressed. The cognitive-affective schemes for junior high are: (1) Societies perceive environmental issues of their time on the basis of past experience, (2) the interaction of the culture with available technology determines the nature of the environment which is planned and developed, (3) social issues and decisions alter the environment, and (4) social issues and decisions determine the utilization of all resources.

At the high school level, the interdisciplinary effort would continue, and a 1-year course would be introduced to bring together, refine, and extend all of the skills, attitudes, and knowledge developed earlier and apply them to the solving of contemporary environmental problems. The high school cognitive-affective schemes include: (1) In any given environment, organisms are linked within an ecosystem, (2) issues and decisions affecting the world ecosystem reflect the pressure of population upon resources, (3) wise utilization of the environment is dependent on the organization of shortage, and (4) the concepts and values man accepts as guides to his future behavior determines the quality of his life, if not his survival.

Materials Available

Information on current materials can be obtained from the ERIC Center for Science, Mathematics, and Environmental Education, 1460 West Lane Avenue, Columbus, Ohio 43221.

Evaluation

None available.

ELEMENTARY ECONOMICS PROJECT

University of Chicago
Chicago, Illinois

Director:	William D. Radar
Project Address:	Industrial Relations Center University of Chicago Chicago, Illinois 60637
Publisher:	Benefic Press 10300 West Roosevelt Road Westchester, Illinois 60153
Publication Date:	1971
Availability:	From publisher
Grade Levels:	6–8
Subject Areas:	Economic core, geography, political science, and sociology

Overview

These materials were developed with a grant from the Charles Stewart Mott Foundation. They are intended as a supplement to a sixth-, seventh-, or eighth-grade course or as a self-contained year-long course in economics. The materials lead students to establish an economic system on a simulated South Pacific Island, a study of the market, a hypothetical trade situation between the United States and Canada, and a changing trade pattern between Malaysia and Brazil. The simulation game *Market* is an integral part of the course but is also sold separately.

Required or Suggested Time

The materials were designed for an extensive 24-week course in economics. If the market game is omitted, the course of study will take approximately 20 weeks. Some but not all of the parts of the course can be taught separately and out of sequence.

Intended User Characteristics

Students of diverse abilities should do well with these materials in a regular social studies classroom situation. The ability of the teacher to pose and sequence questions is a major factor in the success of the program. In addition, the teacher needs to be flexible and resourceful and have a general social science background.

Rationale and General Objectives

In the Teacher's Resource Guide the director states, "We believe the 11- or 12-year-old child is capable of and interested in grappling with abstractions, provided he can detect their resemblance to reality. At this age, children want to better understand their world; they want to be challenged by their educational experiences."

The general objectives of the materials are for students (1) to learn small group skills, (2) to be sensitive to what constitutes economic behavior, (3) to view economic behavior with more concern, (4) to retain some economics concepts and generalizations, (5) to have an awareness of how the social scientist creates knowledge for his own use, (6) to have an awareness that practicing economists use data which is organized in tables and graphs, and (7) to improve their ability to read graphs and tables.

Content

The basic structure of the economic content of these materials is the premise that unlimited wants versus limited resources make choice-making necessary. Decisions have to be made as to how to use resources effectively and determine the priority of wants. This choice-making role must also be played in using the natural resources of the environment. While the content is primarily economics, the materials introduce such concepts as the management and use of resources (both human and natural), man-land relationships and the allocation of scarce resources.

Teaching Procedures

Unit One serves as a general introduction to the three types of economic behavior discussed in the program: production, exchange, and consumption. Written exercises, small group activities, and role playing are woven into the study. In Unit Two the students are involved in a simulation game called *Market*. Some students buy goods while others sell goods, discovering economic concepts of price theory. It shows how the market mechanism controls production. Unit Three presents two case studies in international trade which help the students learn to apply economic concepts to real world situations.

Materials and Cost

The *Economic Man* program includes Teacher's Editions of the student texts, Student Texts, a Teacher Resource Unit, Teacher's Guide to Daily Lessons, and the *Market* game.

Student Texts:

Economic Man: Producer and Consumer: Book I. By Katherine Esch Chapman *et al.* 122 pp., 8½" x 11", stapled paper cover, $1.96.

Economic Man: Buyer and Seller: Book II. By William D. Radar *et al.* 136 pp., 8½" x 11", stapled paper cover, $1.96.

Teacher's Editions:

Economic Man: Book I. 122 pp., 8½" x 11", stapled paper cover, $1.96.

Economic Man: Book II. 136 pp., 8½" x 11", stapled paper cover, $1.96.

Teacher's Resource Unit:

Economic Man: Teacher Resources. 77 pp., 8½" x 11", stapled paper cover, $1.96.

Teacher's Guide:

Economic Man: Teacher's Guide to Daily Lessons. 83 pp., 8½" x 11", stapled paper cover, $1.96.

Market Game materials:
Coordinator's Manual, Retailer and Consumer Envelopes, Food Cards, Paper Money, Coins, Score Sheets, Lists, $48.
Supplementary Coordinator's Manual: 56 pp., 8½" x 11", paperbound; for use with game if game is used separately, 80 cents.
Supplementary Student Manual: 32 pp., 8½" x 11", paperbound; for use with game if game is used separately, 48 cents.

Evaluative Data

Several field tests have been carried out to date. The last one (1969–1970) included rural, urban, and suburban children and investigated the feasibility of using the program in all of the upper elementary grades. These reports are available from the project.

ENVIRONMENTAL EDUCATION PROGRAM

Madison, Wisconsin

Director:	Marvin Meissen
Project Address:	Madison Public Schools 545 West Dayton Street Madison, Wisconsin 53703
Grade Levels:	K–12
Subject Area:	Interdisciplinary

Overview

This program originated as a result of the consolidation of many concepts concerning environmental education and effective learning experiences suggested by the Madison, Wisconsin, teachers. It provides a series of experiences for students at all levels and is based on a logical conceptual framework for environmental education involving all disciplines.

Rationale and General Objectives

The rationale underlying this project may be summarized by these generalizations: (1) each teacher must be responsible for assisting pupils to gain desirable concepts in environmental education, (2) children must be made aware that our way of living depends upon how we use and conserve our natural resources, (3) conservation and environmental education must be integrated with all subjects although some areas may be taught independently as environmental concepts, and (4) concept formation in environmental education occurs when pupils develop understanding, attitudes, and interests which make concepts become positive values.

Specific objectives are (1) to develop a systems approach to environmental education using community and school resources and (2) to develop materials and facilities for use by students in instructional and recreational activities.

Program Description

The program employs 25 naturalists with part-time responsibilities for aiding teachers with learning activities, field trips, and utilizing facilities. Both preservice and inservice education programs are available for teachers desiring to use the materials. The programs include workshops, evening classes, and inservice sessions held at the local schools. Consultant services are also available locally to teachers using the materials.

Materials produced include a *Guide to Environmental Education* for K–6 and, for the secondary level, *Ecology Action Program* and *World Development Program.* A *Science and Society* course incorporates science and social studies and is designed for students in grades 10–12. A similar approach is involved in an *Ecocivics* course for ninth-grade students. At the middle school level, teams of science and social studies teachers utilize a geography-anthropology approach to man and his environment.

The Leopold Elementary School was designed with planned outdoor nature areas on the school grounds, landscaped with native plants such as shrubs, trees, and woodland flowers, to be used in the elementary environmental education program.

Several filmstrips and guides are available to teachers for use with activities conducted at the facilities at the Madison School Forest and the Cherokee Marsh. Other outdoor areas and curriculums for local school use are being planned and developed.

Materials and Cost

Representative materials are:

"What Is a Tour Through the Madison School Forest?"

"Three Layers of Green in the Madison School Forest" (upper elementary grades) and "Madison School Forest: Clues to the Past, Signs of the Future" (middle school) —filmstrips and guide books.

(Contact ERIC/SMEAC for further information on availability and costs.)

Evaluative Data

In 1971 a comprehensive survey of present practice was made, involving a randomly selected sample of all levels of 1,700 teachers in Madison. The information obtained will be used in future planning and scheduling. Constant feedback and input are solicited from staff and students. Records are kept and analyzed.

ENVIRONMENTAL EDUCATION PROGRAM

Paducah Independent Schools
Pauducah, Kentucky

Director:	James M. Major 1000 Clark Street Paducah, Kentucky 42001
Program Address:	Paducah Public Schools 10th and Clark Streets Paducah, Kentucky 42001
Grade Levels:	1–12
Subject Area:	Interdisciplinary

Overview

This program's activities were designed specifically for the Youth Station facilities at Land Between the Lakes, Kentucky, but with a view toward making them adaptable for other locations and programs. The materials were developed through the cooperation of administrators, teachers, and staff of the Paducah Independent Schools and personnel at Land Between the Lakes.

Rationale and General Objectives

The environmental education program is intended to meet the need for a general education effort to produce in future generations interpretations of the profound relationships between resources and ecological balances, regional development, public policy, economics, and human welfare. General objectives for the program are delineated in the areas of knowledge, skills, attitudes, and process. Also included are student goals of self-realization, human relationships, economic efficiency, and civic responsibility. In addition, school objectives are defined as are objectives for specific areas of study, including life science, earth science, astronomy, social science, conservation, pollution, and language arts.

Description

Materials produced include teachers' guides for suggested field activities to be conducted at the Youth Station facilities. The descriptions include objectives (with most specified in performance terms), materials to be used, and suggestions for instruction. The activities require direct involvement of students with the environment; and most are relatively open, tending toward an inquiry orientation. Several of the activities are related to art, social studies, and mathematics. The majority reflect a science orientation.

Background information on the Land Between the Lakes area is provided for teachers along with details regarding available facilities and procedures to be followed. Techniques are described to aid teachers in developing behavioral or performance objectives for learning activities, and suggestions are made for evaluation procedures utilizing these objectives.

Materials and Cost

Teacher's Guide:
Environmental Education Objectives and Field Activities, Fourth Edition, Paducah, Ky.: Paducah Public Schools, 1971, 366 pp. $5.

Evaluative Data

Informal evaluation activities consisting primarily of anecdotal reports from classroom teachers who have taken their classes to the Land Between the Lakes are reported in a publication entitled "Environmental Education Objectives and Field Activities" by James M. Major and Charles A. Cissell.

ENVIRONMENTAL SCIENCE CENTER

Minnesota Environmental Sciences Foundation, Inc.
Minneapolis, Minnesota

Director:	Richard Myshak 5400 Glenwood Avenue Minneapolis, Minnesota 55422
Project Address:	Environmental Science Center 5400 Glenwood Avenue Minneapolis, Minnesota 55422
Publisher:	Minnesota Environmental Sciences Foundation, Inc. 5400 Glenwood Avenue

Minneapolis, Minnesota
55422

National Wildlife Federation
1412 – 16th St., N.W.
Washington, D.C. 20036

Publication Date: 1969

Availability: From publishers

Grade Levels: K–12

Subject Area: Interdisciplinary

Overview

The Environmental Science Center was initially founded to develop and implement programs in environmental education aimed at maintaining an environmental balance. The center was funded in 1967 with a 3-year grant from the U.S. Office of Education under title III of the Elementary and Secondary Education Act of 1965. The program includes vocational and adult education.

Rationale and General Objectives

The overall purpose of the program is to improve the quantity and quality of education pertaining to man's relation to his environment. Specific objectives are to: (1) develop and test model staff development programs in the environmental sciences for elementary and secondary school teachers and administrators, college instructors, youth and adult organization leaders, (2) develop and test inquiry-oriented, interdisciplinary, instructional materials and programs based upon socioecological interrelationships; and (3) assist schools and other agencies to identify, develop, and utilize available natural areas and other community resources as environmental laboratories, i.e., the everywhere classroom.

Description

A series of 43 activities appropriate for use with several grades in the elementary school have been developed. Most of these activities are designed to promote independent study by the pupils and tend to be science-oriented. No sequence of activities is required, permitting teachers to select and order activities as appropriate. The activities are aimed at effecting changes in the cognitive, affective, and psychomotor domains. Objectives are not specified for all activities. Many of the activities are designed for use in an outdoor or community setting, while others may be used in a classroom or indoor laboratory. Additional materials are in planning and developmental stages for all levels K–12 and are intended to reflect an environmental issue-action orientation.

Field trips are scheduled as part of the program with persons from the 11-member staff at the center aiding in planning and utilizing site facilities for learning activities. Consultants are provided to teachers and other persons using the materials and to schools to conduct site surveys for developing outdoor laboratories.

Preservice and inservice education programs are conducted, including evening classes, workshops, and summer institutes.

Materials and Cost

	Grade	*Cost*
Population Perspectives	7–12	$0.50
Salts	5–12	.50
Shadows*	1–6	1.00
Color and Change	K–2	1.00
Soil—Water Holding Capacity	1–6	.50
Auto, Environment and Values	7–12	.50
Soil—Acidity/Alkalinity	K–6	.50
Minnows and Models	4–6	1.00
Stream Analysis	5–12	1.00
Plant Puzzles	1–6	1.00
Transect Activities I	4–9	1.00
Population Variation		1.00
Transect Activities II	4–9	.50
Nature's Art	3–6	1.00
School Site Development		1.00
Brine Shrimp	1–5	1.00
The Cemetery as a Social Document	7–12	1.00
Variation within a Species*	4–8	1.00
Vacant Lot Studies*	5–9	1.50
Population Growth	6–12	1.00
Stream Profiles	4–9	1.00
Button Bags	3–9	1.00
Contour Mapping	4–9	1.00
Tree Watching	K–6	1.00
Nature Hunt	K–6, special ed.	1.00
Population Sampling	3–8	.50

	Grade	Cost
Habitat Study—		
Transect Study		1.00
Habitat Study	3–7	
Transect Study	5–9	
Give Earth a Chance	5–8	4.00
Water Quality	6–12	1.00
Liquids and More Liquids	2–6	.50
Photography for Kids	4–8	1.00
Field Activities Package		1.00
Tubs of Tiles	1–2	.50
Snow and Ice*	1–6	1.50
Where Are the Animals	3–8	1.00
Succession in Micro-Aquaria	5–9	.50
Outdoor Activities Collection	1–12	2.00
Managing Natural Resources**	7–12	refer to #38 in catalog
Plants in the Classroom*	3–6	1.50
Micro-Climates	3–9	.50
Wind*	3–6	1.50
Man's Habitat—The City	4–9	1.00
Squirrels, Acorns and Oak Trees	2–6	1.00

* Available from National Wildlife Federation.

** Available from Documents Section, Room 140, Centennial Office Building, St. Paul, Minnesota 55101

Evaluative Data

A semantic differential test, given under preimposed course conditions, was used to measure changes in attitude toward environmental education and toward an inquiry strategy for teaching. Results are available from the center.

An implementation survey was conducted to determine how many inservice participants had actually used center curriculum materials and which ones were used most frequently. Over 75 percent of all course participants have used an average of two pieces of curriculum materials.

An opinion survey was made to determine participant acceptance of the workshop environment and its interpersonal elements. Respondents showed a strong tendency to agree with the positive statements listed in a group of positively and negatively stated items, indicating that the workshop atmosphere and interpersonal elements were favorably received.

ENVIRONMENTAL STUDIES PROJECT

American Geological Institute
Boulder, Colorado

Directors:	William D. Romey Robert E. Samples
Project Address:	Box 1559 Boulder, Colorado 80302
Publisher:	Project
Publication Date:	Set I (packets 1 and 2) 1970, revised 1971 Set II (packets 3 and 4) 1972
Availability:	From publisher
Grade Levels:	1–12
Subject Area:	Multidisciplinary

Overview

The Environmental Studies Project is one part of the American Geological Institute's Earth Science Educational Program. It is funded by the National Science Foundation with additional grants from the Polaroid Corporation. "The content of the Environmental Studies materials is strongly multidisciplinary representing a many-faceted involvement with the environment including its artistic, scientific, social, and mathematical aspects." The materials were developed for teachers at all grade levels as invitations for student exploration of the immediate environment. They give motivation to further examine the environment and learn to appreciate it. The materials attempt to give the students an awareness of the environment which surrounds them. They are being used successfully in a variety of ways in many different types of school districts.

Required or Suggested Time

The materials in Set I consist of two packets, each containing 25 assignment cards which can be utilized in a variety of ways in varying amounts of time from 1 day to 1 year.

Intended User Characteristics

These materials can be used with students on almost any grade level (they are currently being used from first grade through college) in almost any school setting.

Rationale and General Objectives

The Environmental Studies Project represents an effort to create teacher materials which permit the student to express himself about his immediate environment. "It operates on two premises: (1) every student in an environment, and (2) the student can learn from this environment." The Environmental Studies Project represents an educational philosophy which approaches learning from the standpoint of the learner himself in his own environment.

Content

Since the immediate environment of a human being appears to be the most difficult for that human being to study, these materials endeavor to create instructional tactics and strategies that will enable students to use this resource. For example, instead of asking a student to respond to a textbook abstraction of his environment, the materials ask the student to invent the abstractions that describe what he finds around himself. "Thus, the students are more capable and sensitive to their environment." The materials are written specifically for the teacher and contain assignments, guidelines, and descriptions helpful in studying the environment. Because of the nature of the materials, they may be used as a supplement to existing courses of study or to provide a course in themselves. The materials focus upon four major areas: change, mapping, counting, and judging. "Change is a phenomenological approach that is involved with cause and effect. Mapping is a spatial approach and is primarily concerned with where things are in one's immediate environment. Counting is a statistical approach and is focused on determining how the environment can be better understood by counting certain qualities of it. Judging is the evaluative set of materials designed to get students to make value decisions about the environment."

Teaching Procedures

The assignment cards contain ambiguous suggestions for student action. They are vague because they want "kids to invent an understanding of the problem and to invent a solution." The teacher is to give the assignment on the card to the student or "let the kids choose the assignments they want to do." Some examples of these assignments are: (1) Go outside and collect something that you could use as a tool to create some art; then create some art; (2) find something in the environment that is increasing in number and something that is decreasing in number—and prove it! (3) Go outside and find two things—one of which is responsible for the other; (4) Go outside and find a million of something and prove it; (4) Go out and map something beneath the earth's surface. Class discussions follow.

Materials and Cost

Environmental Studies: Set I, $10.

Packet 1 (25 assignment cards); 8½" x 8½"

Packet 2(25 assignment cards) 8½" x 8½"

Teacher's Booklet, *Essence,* 16 pp.; 8½" x 8½", paperbound.

Evaluative Data

Not available.

FAMILY OF MAN

UNIVERSITY OF MINNESOTA PROJECT SOCIAL STUDIES

Minneapolis, Minnesota

Director:	Edith West
Project Address:	Minnesota Project Social Studies University of Minnesota Minneapolis, Minnesota 55455
Publisher:	Selective Educational Equipment, Inc. (See, Inc.) 3 Bridge Streeet Newton, Massachusetts 02195
Publication Date:	*Levels I and II: Family Studies*

Hopi Indian Family, 1971
Japanese Family, 1972
Family of Early New England, 1972
Ashanti Family of Ghana, 1972
Kibbutz Family in Israel, projected March 1972
Soviet Family in Moscow, projected June 1972
Ouechua Family in Peru, projected 1973
Algonquin Indian Family, projected 1973
Levels III and IV: Community Studies
Contrasting Political and Social Institutions:
Contrasting Communities: Urban and Rural, projected August 1972
The Gold Mining Camp in California, projected November 1972
The People of Paris, projected 1973
The Manus Community of the Admiralty Islands, projected 1973
Contrasting Economic Systems:
Our Own Community: Economic Aspects, projected 1973
Village in India, projected 1973
Economic Life in Soviet Union, projected 1973
The Trobriand Islanders, projected 1973

Availability: From publisher

Grade Levels: K–5

Subject Areas: Interdisciplinary (anthropology, sociology, history, economics, geography, political science)

Overview

Family of Man is a multimedia, elementary 16-unit series which is part of a K–12 curriculum developed by the University of Minnesota Project Social Studies. Each unit, which is packaged in a kit, constitutes a learning system which includes an elaborate media package of filmstrips, audiotapes, printed originals for making student handouts, artifacts, and a teacher's resource guide. Through study of families and communities, students learn to understand concepts and generalizations from the social studies.

Required or Suggested Time

A set of three or four of the kits may be used interchangeably to make up a 1-year social studies program. Single units can also be utilized to enrich and supplement existing courses.

Intended User Characteristics

In order to enhance the adaptability of the materials, the units are not labeled by grade so that they can be used at higher or lower levels or in nongraded or open classrooms. Any competent social studies teacher can teach the program, although he is encouraged to utilize the teacher's guide and read the "Rationale and Overview." Information about inservice training and consultants is available from SEE, Inc.

Rationale and General Objectives

One of the major features of this curriculum is the provision for continuity and early development of content, generalizations, skills, and attitudes with culture as the cornerstone and unifying theme. Values which are sought are curiosity about social data, respect for human dignity, tolerance of diversity, appreciation of other cultures, and understanding of how varying value systems modify and shape the use of the environment.

Content

The content of *Family of Man* is drawn from all the social science disciplines. The students deal with concepts relating to culture, social organization, social process, and site (which is defined as cultural adaptation to the environment) by comparing families and communities in many societies. For instance, the *Hopi Indian Family*, the *Japanese Family*, and the *Family of Early New England* deal explicitly

with societal values which foster positive interaction between man and his environment. The *Kibbutz Family in Israel* is illustrative of productive ways in which man can modify an overtly hostile environment, while the Soviet *Family in Moscow* deals with the impact of technology.

Teaching Procedures

Inquiry is emphasized as a teaching strategy, but it is also recognized that other methods may be more appropriate in reaching certain goals or developing specific skills. The Resource Guides contain "Suggestions for Teaching" each activity and an array of informational material. Each of the suggested activities is related to the content.

Materials and Cost

Hopi Indian Family Kit:
- 9 children's books
- 30 study prints (11" x 14")
- 2 color filmstrips: Traditional and Contemporary Hopi Life
- Audio tape cassettes: Hopi legends and music
- 3 magnetic compasses
- 4 artifacts: yucca sifting basket, Katchina doll, pottery bowl, Hopi toy
- Ear of corn
- 3 printed originals for duplication: family structure sheet, Hopi song lyrics, and chart
- Teacher's Resource Guide: 91 pp., 8½" x 11", paperbound
- "The Rationale and Overview." 38 pp., 6" x 9", paperbound

Materials come in a 20½" x 14" x 6" carrying/storage case
Complete kit, $174.

Japanese Family Kit:
- 11 children's books
- 11 study prints (11" x 14")
- 3 color filmstrips: Village and City Life in Japan
- 1 audio tape cassette: Japanese children's stories and music
- 3 magnetic compasses
- 1 Japanese flag
- Wall map of Japan
- Rice seed
- Origami paper
- 17 artifacts: teapot, teacup, rice bowl, rice paddle, small dish, 36 pairs of chopsticks, child's kimono sash, geta, slippers, Buddha statue, incense burner, abacus, calligraphy set
- 7 printed originals for duplication
- "A Rationale and Overview" 38 pp., 6" x 9", paperbound
- Teacher's Resource Guide. 124 pp., 8½" x 11", paperbound

Materials come in two 10½" x 17½" x 5", and 15" x 10" x 4½" carrying/storage case
Complete kit, $174.

Family of Early New England Kit:
- 4 children's books
- General reference book
- 20 study prints (11" x 14")
- 2 color filmstrips: Early New England Life
- 1 audio tape cassette: Early New England Songs and Stories
- 3 magnetic compasses
- Ear of Indian Corn
- 10 artifacts: churn, broom, slate and pencil, quill pen and inkwell, tin candlestick, bayberry candle, cornhusk doll, toy top
- 7 printed originals for duplication
- "A Rationale and Overview." 38 pp., 6" x 9", paperbound
- Teacher's Resource Guide: 120 pp., 8½" x 11", paperbound

Materials come in a 36" x 18" x 4" corrugated cardboard carrying/storage case
Complete kit, $174.

Ashanti Family of Ghana Kit:
- 17 children's books
- 20 study prints (11" x 14")
- 2 color filmstrips: Ashanti Life in Ghana
- 1 audio tape cassette: Ashanti Songs and Legends
- 3 magnetic compasses
- Cocoa beans
- 6 artifacts: Ashanti stool, Kente ceremonial cloth, a gold weight, an Akuaba doll, Oware board and beads
- 5 printed originals for duplication
- "A Rationale and Overview." 38 pp., 6" x 9", paperbound

Teacher's Resource Guide: 115 pp., 8"½ x 11", paperbound
Materials come in a 36" x 18" x 14" corrugated cardboard carrying/storage case
Complete kit, $174.

Available Separately:

A Rationale and Overview. 38 pp., 6" x 9", paperbound, $2.
Additional Teacher Resource Guides with set of originals, $8.
Price lists for individual replacement items are available on request.

Evaluative Data

The *Family of Man* multimedia units have not been objectively evaluated; however, the prototype units from Minnesota were studied in a number of schools. Standardized test results showed that the students using the material did as well or better, with respect to content, than control groups in regular courses.

FIELD SOCIAL STUDIES PROGRAM

California

Directors:	Richard E. Gross, Professor of Education Stanford University John U. Michaelis, Professor of Education University of California at Berkeley
Publisher:	Field Educational Publications, Inc. 2400 Hanover Street Palo Alto, California 94304
Publication Date:	1970
Availability:	From publisher
Grade Levels:	1–4
Subject Area:	Multidisciplinary social sciences

Overview

The Field Social Studies Program is a K–12 program in social studies/social science education based on what the directors describe as an inquiry-conceptual approach to learning. Each of the textbooks reflects the Field Program's basic belief that students must be involved in an inquiry process in order for effective learning to take place. Therefore, each textbook combines inquiry, concept, skill, attitude, and value objectives in structuring the instructional program. Although there are materials available for grades K–12, only those in grades 1–4 deal, to a degree, with environmental education. *Working, Playing, Learning* is the first-grade component and is based on the premise that first-grade children are able to learn from their daily experiences. Pictures are used extensively to provoke student inquiry. *People, Places, Products* is the textbook for grade 2 and uses pictures to stimulate inductive investigation of five different types of communities—fishing, grain-farming, cattle-raising, lumbering, and cotton- and garment-producing communities. *Towns and Cities,* the third-grade component, is structured to attain conceptual, inquiry, skill, and affective objectives. The major content emphasis is on urban communities and how they change. *Regions Around the World* is a textbook for fourth-grade students which emphasizes the earth as the home of man and the interrelationships between man and his physical-biotic environment.

Required or Suggested Time

Each level of the Field Social Studies Program is designed to form the basis for 1 year of study in the curriculum. They may, however, be used independently from other components of the program.

Intended User Characteristics

The materials are intended for average students in these grade levels. The Teacher's Guides provide background reading to accompany each chapter; therefore, no special teacher training is required. Some general background in social science might prove helpful.

Rationale and General Objectives

The directors of the Field Social Studies Program believe that it reflects the very latest research on how children best learn social studies. The basic premise of the program is

the inquiry-conceptual approach in which three components—inquiry processes, concepts, and settings—are interlinked to make significant contributions to social studies instruction. The materials constantly stress the interrelationships between concepts from the various social sciences because the directors believe a single-subject approach gives too narrow a view of most areas of concern today. Each part of the program has four types of general objectives for students to accomplish. Conceptual objectives are concerned with knowledge and understanding of people. Inquiry objectives focus on competence in understanding and using various processes of inquiry. Skill objectives stress language and study abilities related to the social sciences. Affective objectives consist of values, attitudes, and interests inherent in the development and future of society.

Content

The Field Program utilizes concepts from the social sciences throughout the program and is designed to reflect the needs of most school systems in social studies instruction. The specific content emphasis differs at each grade level, with the first four levels taking a dominantly multidisciplinary approach to increase the students' sophistication in study, awareness, and understanding of themselves and the people around them. The concern with environmental education is particularly felt with the materials for grades 1–4. The first-grade materials, *Working, Playing, Learning,* include the study of schools, families, and communities, with a resource unit on the study of the earth as a place where people live and interact with the environment. *People, Places, Products,* the second-grade textbooks, deals with the five major types of communities mentioned above by using six lessons for each. The first lesson of each unit deals with the primary industry involving raw materials. The second lesson presents contrasts in secondary industries concerned with product development, while the third lesson shows the lives of people in contrasted countries. The fourth lesson points out problems affecting industrial productivity, and the fifth lesson illustrates how science was used to solve problems and improve products. The final lesson in each unit reinforces ideas about similarity and diversity in industry around the world. The resource unit included with the second-grade material is used to develop the students' understanding of the diversity of the earth's regions, both geographically and in relation to man's dependence upon them. The first three chapters of *Towns and Cities,* the grade 3 textbook, introduce students to important characteristics of modern American cities. The chapters which follow examine the historic growth of cities and the changes which have taken place in the development of urban areas. The book concludes with an overall examination of problems faced by cities today, aiming at having students feel knowledgeable and responsible for improving cities in the future. The fourth-grade program, *Region Around the World,* is based on three broad categories of concepts from the social sciences: learning about the earth as a planet in space, learning about the earth as a variety of physical and biotic landscapes, and learning about the earth as a variety of cultural landscapes. Resource utilization and conservation are examined. Students are encouraged to respect the complexity of the earth and its structure, with a view toward solving its problems.

Teaching Procedures

Each level of the program includes a Teacher's Guide which offers suggestions for implementation of the materials with a general instructional format. Units are usually initiated by an activity designed to provoke curiosity and provide a focus for inquiry and learning. This activity is followed by developmental activities aimed at involving students in the inquiry process. Students are encouraged to raise questions for themselves and for discussion, and to pursue answers to their questions. Units usually conclude with review or synthesizing activities and suggestions for further individual and group inquiry. The materials can easily be adapted by the individual teacher according to his own teaching preferences. According to the directors, the teacher, regardless of the activity, functions as a catalyst and a co-inquirer in the learning process of the student.

Materials and Cost

Working, Playing, Learning (Grade 1)

Student Text: *Working, Playing, Learning.* By Ruth H. Grossman and John U. Michaelis. 144 pp., 8" x 10¼", hardcover, $2.97.

Teacher's Guide: 176 pp., 8" x 10¼", hardcover, $2.97.

People, Places, Products (Grade 2)

Student Text: *People, Places, Products.* By Ruth H. Grossman and John U. Michaelis. 160 pp., 8" x 10¼", hardcover, $3.85.

Teacher's Guide: 192 pp., 8" x 10¼", hardcover, $3.15.

Multimedia Package: 5 color filmstrips each with a 33⅓ rpm record; paper posters; 1 Teacher's Guide, 64 pp., 13½" x 10", stapled paper cover; all contained in cardboard box 17½" x 13½", $67.50.

Towns and Cities (Grade 3)

Student Text: *Towns and Cities.* By Phillip Bacon and Ronald Reed Boyce. 256 pp., 8" x 10¼", hardcover, $4.14.

Teacher's Guide: 352 pp., 8" x 10¼", hardcover, $4.14.

Multimedia Package: 3 long color filmstrips, each with a 33⅓ rpm record, titled "Cities Are People," "City Problems," and "People Solve Problems"; 8 short color filmstrips with two 33⅓ rpm records, titled "Keeping People Healthy," "Fire," "Water Watchers," "Where the Action Is," "People, People Everywhere," "What Shall We Do Now," "Going Places," and "Quiet Please"; paper posters, 1 Teacher's Guide, 64 pp., 13½" x 10", stapled paper cover, $75.

Regions Around the World (Grade 4)

Student Text: *Regions Around the World.* By Phillip Bacon. 320 pp., 8" x 10¼", hardcover, $4.41.

Teacher's Guide: 384 pp., 8" x 10¼", hardcover, $4.41.

Multimedia Package: 3 long color filmstrips, each with a 33⅓ rpm record, titled "Man Uses the Land," "The Land Has Many Faces," and "Man Changes the Land"; 9 short color filmstrips, titled "Fiji," "Nepal," "Lapland," "New Zealand," "Portugal," "England," "California," "Alaska," and "Tahiti"; 1 paper map; 1 Teacher's Guide, 64 pp., 13½" x 10", stapled paper cover; all contained in cardboard box 17½" x 13½", $68.

Evaluative Data

Not available.

HIGH ROCK CONSERVATION CENTER

Staten Island, New York

Project Address: Nevada Avenue
Staten Island, New York
10306

Grade Levels: 1–12

Subject Areas: Conservation, environmental education, biology, geology, interdisciplinary

Overview

This center is a unit of the New York Park System operated by the Staten Island Institute of Arts and Sciences. Educational activities at this natural habitat have been developed for students from grades 1–12. Teachers take classes to the center; self-guided walks are also permitted.

Rationale and General Objectives

This program is designed to develop an environmental awareness. Topics stress:

- The importance of the environment in providing for our needs as well as those of other organisms.
- An awareness of how man changes or destroys his environment.
- A recognition of the need to correct these abuses to the environment.
- The responsibility and the desire to protect and to improve the quality of the environment.

Description

The program involves a number of activities

which have been developed for use by teachers and students at their school and while at the park. Each activity is designed as a discovery experience and to encourage maximum involvement of each child. Most activities provide material for study prior to coming to the park for activity at the park, and for followup studies after returning to their schools.

Teacher's guides, student materials, and newsletter including ideas on the use of the area are provided.

Materials Available

A materials list including a teacher's guide and student materials is available from the ERIC Center for Science, Mathematics, and Environmental Education, 1460 West Lane Avenue, Columbus, Ohio 43221.

Evaluation

Activities have been used extensively with teachers and students and revised.

HIGH SCHOOL GEOGRAPHY PROJECT

Washington, D.C.

Directors:	William Pattison, Nicholas Helburn, and Dana Kurfman
Project Address:	Since the project closed in August 1970, project business is being handled by the Association of American Geographers 1146 16th Street, N.W., Washington, D.C. 20036
Publisher:	The Macmillan Company School Division 866 Third Avenue New York, New York 10022
Publication Date:	Units 1 and 2, 1969 Units 3 through 6, 1970
Availability:	From publisher
Grade Level:	10 (7–12)
Subject Areas:	Geography core, anthropology, economics, history, political science, and sociology

Overview

High School Geography Project materials were developed by the Association of American Geographers during a 10-year period which ended in 1970. Funds were obtained from a variety of sources including over $2 million from the National Science Foundation. Unit 5, "Habitat and Resources," contains good social science tools and content designed to foster student involvement with real world problems. Other units from the High School Geography Project could be utilized for concept development, but they do not focus as directly on environmental problems. The multidisciplinary program was designed primarily as a 1-year geography course for tenth graders; however, it has been used successfully at all secondary levels. "Habitat and Resources" is a 5–7 week unit which contains a vast array of student activities and educational media. Evaluation of the High School Geography Project indicates significant cognitive and affective growth is attained with its use.

Required or Suggested Time

The course is designed for a 1-year course in geography. Units can be purchased and used separately in the following time periods:

Unit 1: 5–7 weeks; Unit 2: 6–8 weeks; Unit 3: 3–4 weeks; Unit 4: 4–5 weeks; Unit 5: 5–7 weeks; and Unit 6: 3 weeks.

Intended User Characteristics

Although the materials were written for the average tenth grader, they have utility for grades 7 through 12. Any secondary social studies teacher can successfully implement the course, although a background in geography might be helpful.

Rationale and General Objectives

The basic premise of the course is that gegoraphy has special ways of looking at the world and at the growing accumulation of facts which help students understand relationships according to a different order and perspective. The major goal of the program is to provide an appropriate educational experience so that students will gain both cognitive and analytic skills.

Content

The four major geographic content approaches (spatial, area studies, man-land tradition, and earth science) are combined throughout and amplified with concepts from all social science disciplines. After working with the content of Unit 5, for instance, students should be able to categorize habitats according to ways in which they have been modified by man, explain why habitats are used differently by people with cultural traditions and technological capabilities, and recognize and interpret the conflict over resources.

Teaching Procedures

Inquiry methods which lead students from evidence to hypotheses are skillfully articulated through the mix of student-teacher interaction which includes collection and evaluation of data, analysis, generalizing, decisionmaking, and role playing games.

Materials and Cost

Unit 5: "Habitat and Resources"

Student Materials:

1 Resources book; 85 pp., 8½" x 10", paperbound, $1.20.

1 Manual workbook; 20 pp.; in sets of 10, $2.40 per set.

Teacher's Materials: kit contains

1 Teacher's Guide, 78 pp.; 1 transparency packet; 1 set of role profiles; 3 sets of readings; 15 sets of maps, $39.75.

NOTE.—A copy of *The Local Community: A Handbook for Teachers,* developed as a supplement to the High School Geography Project materials, was received too late for entry into this report. It appears, however, to be of great use for high school classes wishing to investigate man-environment relationships in their home communities. The volume contains detailed guidelines for planning, preparing, and conducting a variety of learning activities drawing on many local resources, from telephone books to people.

Evaluative Data

The program was evaluated both formatively and summatively in numerous school settings. The data indicate that there was significant student attainment in both the cognitive and affective domains.

INTERACTION SCIENCE CURRICULUM PROJECT

Chicago, Illinois

Director:	Norman Abraham
Project Address:	Interaction Science Curriculum Project Rand McNally and Company Chicago, Illinois
Publisher:	Same as project
Publication Date:	July 1970
Availability:	From project
Grade Levels:	6–9
Subject Area:	Science

Overview

The publication offers the student an opportunity to acquire the knowledge necessary to understand man's place in the biosphere and his biological heritage. Topics within the text are dependent; continuity is maintained from one section to the next. Each topic is accompanied by a series of laboratory investigations. Most of the student's time is to be spent in laboratory sessions—raising questions, observing, conducting investigations, collecting and interpreting data, and drawing conclusions. Students are encouraged to maintain their own careful record of laboratory activities.

Required or Suggested Time

Intended for an academic year of study.

Intended User Characteristics

The publication is designed for junior high school students. If suggested teaching procedures are followed, the teacher must act as a guide and facilitator in the highly structured program of student inquiry.

Rationale and General Objectives

In order to intelligently use and apply technology, the student must study "interactions among living things, interactions between living things and the nonliving environment, and the significance of these interactions to the continuing existence of life on this planet." Science is a creative activity; thus the study of interactions must be accomplished through student inquiry.

Content Related to Environmental Education

Section One: Life in the Biosphere—Photo essays of air pollution, junk yards, soil erosion, and undisturbed woodlands are presented to the student as scenes from an imaginary planet. Students are asked to describe their impressions of the scenes and also how the inhibitants of planet X probably feel about their environment.

Section Six: Internal Balance—Students are asked to describe environmental conditions that disrupt the internal balance of man and other organisms, and how the biosphere can be maintained as a fit place to live.

Section Seven: Man and Nature—The impact of man's activities through the centuries is described. Evidence of man's activities takes many forms. Activities such as chemical, thermal, noise, and solid-waste pollution are emphasized and related to "environmental quality rating" in the students' community. Student investigations involve the interpretation of local population problems, the establishment of environmental priorities, and participation in mock environmental hearings.

Section Eight: Ecological Interaction—In a population, how is biotic potential related to environmental resistance? How has man attempted to raise or lower environmental resistance? Investigations involve ecological interactions.

Teaching Procedures

Textbook readings are followed by laboratory investigations and student discussions.

Materials and Cost

Student text in hardback (when buying 30 copies), each $5.22.

Teacher edition in paperback, free with class order

Achievement tests:

Quarterly (for 30 students), $27.

Final, combined forms A & B forms, (for 30 students), $13.95.

Answer sheets (128), $4.95.

Kits:

Nonconsumable (for 30 students), $340.

Consumable (for 30 students), $80.

Evaluative Data

The publication has been tested, evaluated, and revised several times through the assistance of numerous teachers, and students.

LAND BETWEEN THE LAKES CONSERVATION EDUCATION CENTER

Golden Pond, Kentucky

Director: John Paulk

Project Address: P.O. Box 27
Golden Pond, Kentucky
42231

Grade Levels: 4-9

Subject Areas: Conservation, outdoor education

Overview

Land Between the Lakes, a 170,000 acre strip of land between Kentucky Lake and Lake Barkley in western Kentucky and Tennessee, was developed as a national demonstration center in outdoor recreation and conservation education in 1963 under the guidance of the Tennessee Valley Authority. A major portion of the education program is concentrated in the Youth Station, a major facility within the Conservation Education Center.

Rationale and General Objectives

The basic purpose of the Youth Station is to introduce resident outdoor and conservation education programing to as many educators as possible. The center staff aids schools in developing their own programs to include the natural and cultural environment into the existing curriculum through the utilization of natural phenomena and the outdoor setting.

The following basic objectives have been established for the Youth Center:

1. To introduce outdoor and conservation education to school systems as good education that is a part of the total curriculum and is integrated with all areas of the ongoing program.

2. To demonstrate that an outdoor education resident facility utilized as a part of the learner's total education provides learning and living experiences which enable students to develop better academic success and attitudes toward life.
3. To promote an attitude of environmental awareness and develop a sense of responsibility and interest toward our environment and natural resources.
4. To provide a setting and atmosphere for assisting the professional educator in achieving the following basic objectives with students in his charge: self-realization, human relationship, economic efficiency, and civic responsibility.
5. To provide a facility where school children, generally in grades 4 through 9, and their leaders may reside and participate in their own outdoor education programs and projects.

Description

Because the major emphasis is upon teacher education, relatively low emphasis is placed upon the development of materials by the center. Consultant services and workshops are made available to teachers to enable them to plan and develop learning activities that fit their own needs prior to bringing their students to the site.

Summer workshops, designed to show how the outdoors can be incorporated into the curriculum, provide for inservice education. In addition, college and university students learn methods and techniques for outdoor teaching in a natural setting.

Some descriptive, supplementary materials are available for teacher use when classes are brought to the Land Between the Lakes.

Materials

Supplementary materials

Field Guide to Mammals of Land Between the Lakes
Field Guide to Wading and Upland-Game Birds of Land Between the Lakes
Maps Are for Fun! Knowledge!
Bald Eagles in Land Between the Lakes
A Checklist of Birds of Land Between the Lakes
Long Creek Trail
Woodland Walk

Materials available from the Tennessee Valley Authority, Golden Pond, Kentucky 42231.

Evaluative Data

Information concerning the utilization of the Youth Station by elementary and secondary schools, college and university groups, non-school groups and observers, and for teacher workshops is contained in a publication, "Report on the Youth Station April 1966-December 1969," by the Conservation Education Section of the Tennessee Valley Authority.

MAN: A COURSE OF STUDY

Education Development Center
Cambridge, Massachusetts

Director: Peter B. Dow

Address: Education Development Center
Cambridge, Massachusetts

Availability: Curriculum Development Associates, Inc.
Suite 414
1211 Connecticut Ave., N.W.
Washington, D.C. 20036

Grade Levels: 4–6

Subject Area: Social studies

Overview

This set of materials is a part of the Social Studies Curriculum Program and is designed for use in the upper elementary grades. The materials are based on three questions: What is human about human beings? How did they get that way? and How can they be made more so?

Required or Suggested Time

The materials are intended for an academic year of study.

Intended User Characteristics

The materials have not been designed for any specific target group. However, the mate-

rials are available only after teachers have participated in workshops.

Rationale and General Objectives

This set of materials is written to help students explore some basic ecological considerations about man and animals in the web of their relationships to their environment.

Content

Exploratory materials concern the roots of man's social behavior through the study of selected animal groups and an intensive examination of a remote society very different from our own. Several weeks' work is devoted to the Netsilik Eskimos: the direct dependence upon the Arctic animal life for food, tools, clothing, and shelter; the hazards of exposure; and the variables beyond man's control. Comparisons with the students' more remote dependence on and greater protection from the environment are encouraged. Questions and activities on the quality of life and the environment and the effects of industrialization and urbanization could be designed to follow the Netsilik activities effectively.

Man: A Course of Study depends heavily on motion picture films printed materials in support.

Training

Special teacher training in the use of the materials is recommended.

Materials and Cost

Information on materials and prices can be obtained from:

Education Development Center, Inc.
55 Chapel St.
Newton, Massachusetts 02160

MAN AND HIS ENVIRONMENT, AN INTRODUCTION TO USING ENVIRONMENTAL STUDY AREAS

American Association for Health, Physical Education, and Recreation
Association of Classroom Teachers
National Education Association
Washington, D.C.

Director:	Sidney Dorros
Project Address:	National Education Association 1201–16th Street, N.W. Washington, D.C. 20036
Publication Date:	1970
Availability:	National Education Association Publications-Sales Section 1201–16th Street, N.W. Washington, D.C. 20036
Grade Levels:	K–12
Subject Area:	Interdisciplinary

Overview

By using an interdisciplinary approach to environmental education, this booklet is intended to help teachers expand their classrooms to include all of man's environment. A student is encouraged to develop an awareness of his environment that will lead to a personal sense of involvement and the shaping of an environmental ethic.

Required or Suggested Time

No time specifications are indicated. The activities may be used for a period of from one to several days.

Intended User Characteristics

The materials were designed for use with the NEED and NESA programs which were originally intended for use with inner-city children. However, the materials are appropriate for use with all students K–12 and for a wide range of programs.

Rationale and General Objectives

The stated objectives are those indicated by the National Park Service as the principal objectives of an environmental study area program: (1) To introduce the student to his total cultural and natural environment, past and present, and help him realize that he is a part of it, (2) To develop in the student an understanding of how man is using and misusing his

resources, (3) To provide an opportunity for the student to work directly with environmental problem solving, and (4) To equip the student to be a responsible member of the world that he is shaping and that is shaping him.

Content

The booklet provides the teacher with information on the background of environmental study area programs, suggestions for selecting sites and planning programs, and aids to identifying the educational possibilities of a site and preparing lessons related to them.

Sample learning activities using the five strands—variety and similarities, interaction and interdependence, continuity and change, evolution, and adaptation—are included for art, mathematics, science, social studies, and communications. Lesson suggestions and discussion questions are presented for each activity.

Teaching Strategies

The developers recommend the strand approach, which incorporates both the specific, or taxonomic, and the investigative approaches. This requires identification and classification but on a modified basis, and also requires open-ended investigation leading to problem solving.

Materials and Cost

Teacher's material:

Man and His Environment. 58 pp., 7" x 10"; stapled paperbound booklet, $1.75.

Evaluative Data

The materials were process-evaluated by trial testing with the NEED and NESA programs and by expert review. Evaluative data are currently not available.

MAN AND THE ENVIRONMENT

Educational Research Council of America
Cleveland, Ohio

Authors:	Frederick A. Rasmussen, Paul Holobinko, and Victor Showalter
Publisher:	Houghton Mifflin Company Boston, Massachusetts
Publication Date:	1971
Availability:	From publisher
Grade Levels:	7–9
Subject Area:	Life science

Overview

The textbook *Man and the Environment* presents a series of life science investigations designed to help students develop insights about themselves, their biological environment, and real-life problems involving biology, technology, and society.

Required or Suggested Time

The textbook and materials are intended for an academic year course, meeting 5 days a week for 40 minutes a day.

Intended User Characteristics

The materials are intended for junior high school students but not for any specific target group within this population.

Rationale and General Objectives

Two basic assumptions underlie *Man and the Environment:* one, that the essence of science includes the "how" as well as the "what" —that students must learn how scientific information is acquired as well as information itself; two, general ideas in life science have personal and social relevance.

These assumptions are translated into four general goals: (1) students should demonstrate an inquiry approach to biology and be able to design and carry out simple experiments with living organisms; (2) students should understand the interaction between living organisms and their physical environment, recognizing the complexities of ecological situations; (3) students should be able to separate fact from opinion in a controversial ecological problem and state what social responsibilities are involved; and (4) students should be aware of individual variation in man and other organisms and recognize the uniqueness of each living thing.

Content

The book is divided into four units: investigating living things, the environment affects living things, living things affect each other, and man's effect on the environment. Students are presented with a series of problems, questions, or issues, with each group of activities being entitled an "investigation." The amount of student freedom provided varies with the investigations, with early activities being the most structured.

Each investigation is composed of an introduction, objectives to be achieved, the problem or problems, and mastery items. Students as well as teachers are given the rationale and behavioral goals for the investigations.

In addition to the textual material, four games are suggested for use: "The Mouse in the Maze," "The Planet Management Game," "The Pollution Game," and "The Redwood Controversy." These must be purchased separately from, and are more expensive than, the book. The textbook could be used without the games, however.

Training and Teaching Suggestions

No specific training for teachers is involved in the use of these materials. A teacher's edition of the book is available and contains suggestions for teaching as well as annotations on the textual material.

Materials and Cost

Life Science, student book, $6.96.
Teacher's edition, $7.40.
Check-points (tests), $1.20.
Answers to tests, $1.20.
Laboratory supplement, $1.40.
"The Mouse in the Maze," $8.
"The Planet Management Game," $16.
"The Redwood Controversy," $10.
"The Pollution Game," $12.

THE MAN MADE WORLD

Engineering Concepts Curriculum Project (ECCP)
Washington, D.C.

Director (for materials development):	E. E. David, Jr. Bell Telephone Laboratories Murray Hill, New Jersey
	J. G. Truxal Polytechnic Institute of Brooklyn 333 Jay Street Brooklyn, New York
Project Address:	Commission on Engineering Education 1501 New Hampshire Ave., N.W. Washington, D.C. 20036
Publisher:	McGraw Hill Book Company Manchester Road Manchester, Missouri 63011
Publication Date:	1967
Availability:	Printed materials: from publisher
	Classroom equipment: American Machine and Foundry Company Alexandria, Virginia
Grade Levels:	11–12
Subject Area:	Science

Overview

The Man Made World was developed as a result of work by the Engineering Concepts Curriculum Project, a joint effort of the Commission on Engineering Education and the Polytechnic Institute of Brooklyn, with support from the National Science Foundation. Designed to help students develop an understanding of the complexity of technological problems and the methods being used to solve them, *The Man Made World* looks at problems of pollution, population health services, computers, and traffic control in terms of decisionmaking.

Required or Suggested Time

The course is intended for an academic year of study.

Intended User Characteristics

The materials for the course have been designed to attract those high school students

who do not now take a science elective beyond the 10th grade.

Rationale and General Objectives

The ECCP course has been developed as an alternative to other science courses, not as a replacement. It is based on technological concepts that have broad relevance and significance for society, and is designed to provide "science shy" college-preparatory students with an opportunity to understand certain principles in engineering, science, mathematics, and social studies which pervade the students' daily lives. Laboratory and computer facilities provide the students the opportunity to experiment and translate abstract concepts into concrete situations.

Content

The course materials emphasize searching for and exploring ideas in terms of the study of significant, current problems. The material is drawn from concepts in engineering, science, mathematics, and social studies. The course is independent of high school biology, physics, chemistry, and mathematics, although a background in mathematics is a prerequisite.

The textbook has three parts: Part A—Logic and Computers is concerned with logic and digital computation; Part B—Models and Measurement serves to introduce the student to models as tools for aiding human thought and understanding and for predicting; and Part C—Energy and Control introduces the concept of feedback as a means of achieving a specific goal.

Text material is supplemented by laboratory experiments performed by the students and by several demonstrations.

Materials and Cost

Man Made World, $11.95.
Laboratory manual, $2.40.
Additional materials to be on the market this spring include:

- Teachers manual plus transparencies
- Teachers manual (only)
- Packet of five tests and final exam (25 copies/packet)
- Transparency masters

No prices have yet been set on the above four items.

MATERIALS AND ACTIVITIES FOR TEACHERS AND CHILDREN (MATCH)

Boston, Massachusetts

Project Address: MATCH Program Director
The Children's Museum
Jamaicaway
Boston, Massachusetts
02130

Publisher: Americans Science and Engineering, Inc.
20 Overland Street
Boston, Massachusetts
02215

Grade Level: Elementary

Subject Areas: Environmental education, social science

Required or Suggested Time

Each MATCH Unit contains enough materials for a class of 30 children to use for 2 or 3 weeks.

Intended User Characteristics

Materials are based on the idea that much of learning is nonverbal, through activity with things rather than with words. Hence, they are effective with all ability ranges of elementary school pupils including slow readers and many pupils who are not motivated in traditional classes.

Rationale and General Objectives

Each unit is designed as a unique self-contained system of materials and activities which the teacher uses to produce a series of interrelated learning experiences on a particular subject. Emphasis is placed on learning through the use of real materials, on the child as the agent of his own learning, and upon an essentially collaborative and nondirective relationship between teacher and child.

Content

Sixteen units have been developed. Three units are available on a commercial basis. Content emphasizes people from various lands, including one unit titled *The City* which relates to environmental education. Models, photographs, records, and films are included in the kit, *The City.*

Teaching Strategies

The teacher is to use primarily a nondirective technique with pupils. The pupils' ideas are to emerge from working with the materials.

Materials

Three units are available commercially from the publisher—*The City, A House of Ancient Greece,* and *Japanese Family*. A list of publications on the units available through ERIC is available from the ERIC Center for Science, Mathematics, and Environmental Education, 1460 West Lane Avenue, Columbus, Ohio 43221.

Evaluative Data

All materials have been tested in schools. Data indicate students learn effectively with and enjoy the materials.

NATIONAL ENVIRONMENTAL EDUCATION DEVELOPMENT (NEED)

National Park Service
Washington, D.C.

Director: George B. Hartzog

Program Address: National Park Service
U.S. Department of the Interior
Washington, D.C. 20240

Grade Levels: K–12

Subject Area: Interdisciplinary

Overview

The NEED program, funded by the National Park Foundation, is concerned with the development of teaching materials and a program of studies and experiences for levels K–12 to help enrich existing curriculums with environmental concepts. The materials are intended to help teachers develop ways to teach about the environment in every subject area.

Rationale and General Objectives

The goal of the NEED program is to foster an appreciative and critical environmental awareness in youth through an understanding of natural and social processes illustrated in National Park areas. Further, the program aims to increase the will and capacity to improve the environment and to aid youth in developing an environmental ethic.

Program Description

The program is based on the premise that environmental awareness requires outdoor implementation of classroom lessons. Organization of the program is developed around five major ideas: variety and similarities, patterns, interaction and interdependence, continuity and change, and evolution and adaptation. These form the strands that run through lessons in mathematics, art, social studies, communications, and science.

There are three phases to the program. Phase I, for K–6, emphasizes awareness, focusing on understanding and appreciating the natural and cultural environment. Phase II, for grades 7–8, is the technical phase and focuses on man's use and abuse of water, land, and other resources. Phase III, for high school students, is the ethical phase and stresses the need for environmental management and planning—an environmental ethic.

As the program was originally conceived, the intention was to get inner-city children out into a natural study area for an entire school week. As the program has developed, it has expanded beyond this beginning to include pupils from all areas and backgrounds. Throughout the program students may go on local field trips to supplement their classroom studies, and sometime during the fifth or sixth grade the children spend 5 days with their teachers in some natural area. While some NEED sites are in national parks, not all are. The NEED program is closely related to the National Environmental Study Area program (NESA) also developed by the National Park Service.

Location of Sites

For further information on the locations of sites, write:

Director
National Park Service
U.S. Department of the Interior
Wash., D.C. 20240

Northeast Region
National Park Service
143 South Third St.
Phila., Pa. 19106

National Capital Parks
National Park Service
1100 Ohio Drive, S.W.
Wash., D.C. 20242

Southeast Region
National Park Service
Federal Building
P.O. Box 10008
Richmond, Va. 23229

Midwest Region
National Park Service
1709 Jackson St.
Omaha, Neb. 68102

Southwest Region
National Park Service
P.O. Box 728
Santa Fe, N.M. 87501

Western Region
National Park Service
P.O. Box 36063
San Francisco, Calif.
94102

Northwest Region
National Park Service
Room 931
4th and Pike Bldg.
Seattle, Wash. 98101

Materials and Cost

A general guide book to help schools establish and operate such programs is:

Man and His Environment, An Introduction to Using Environmental Study Areas, Washington, D.C.: National Education Association, 1201 Sixteenth Street, N.W., $1.75.

The following materials are available from: Silver Burdett Publishers, 4200 North Industrial Boulevard, Indianapolis, Indiana 46254:

Grades 5–6—NEED Project
Teacher's booklet—Code 46–130–56
Student's booklet—Code 46–100–56
Grades 5–6—NEED Response Booklet
Student's booklet—Code 46–120–56
Grades 4–9—NEED—Environmental Education
Teacher's booklet—Code 46–190–00

Evaluative Data

The program has been field tested on a nationwide basis for approximately 3 years. While no data are currently available, it has been reported that students show evidence of increased personal awareness and a sharpened sense of the environment and the interweaving of self and world.

NATIONAL ENVIRONMENTAL STUDY AREA (NESA) PROGRAM

National Park Service
Washington, D.C.

Director: George B. Hartzog

Program Address: National Park Service
U.S. Department of the Interior
Washington, D.C. 20240

Grade Levels: K–12

Subject Area: Interdisciplinary

Overview

The National Environmental Study Area (NESA) program is a cooperative undertaking of the bureaus within the U.S. Department of the Interior, the U.S. Department of Health, Education, and Welfare's Office of Education, the National Education Association, and local education communities, using guide materials developed by the National Park Service and the existing curriculums of participating schools.

Rationale and General Objectives

The NESA's are intended to provide a learning experience which makes use of both the natural and cultural worlds. The study areas, along with the guide materials and regular school experiences, are intended to help the students relate to their world by:

1. Introducing them to their total environment—cultural and natural, past and present.
2. Developing in them an understanding of how man is using his resources.
3. Equipping them to be responsible and active members of the world they are shaping and being shaped by.

Program Description

The Park Service has designated areas throughout the Park System and on other lands as environmental study areas for use by local school systems. Some of these sites are primarily natural and exemplify the elements and forces and balances in nature—out of which man is made and out of which he builds his cities, society, and culture. Other sites are primarily cultural, a rise of ground that formed a logical battle site, or a landing area along a river that developed into a gateway into some interior region. In these places a youngster learns to recognize how the environment has affected man's development and how man, in turn, has affected the environment.

The program is developed around five environmental strands: interaction and interdependence, variety and similarity, patterns, change and continuity, and adaptation and evolution. The NESA guidelines, developed by the National Park Service and the National Education Association, provide a framework within which the local area can adapt to its own needs. Teacher workshops are set up through the sponsoring agencies and carried out with the cooperation of the local school systems. At the workshops, teachers are introduced to the NESA, provided resources materials on the areas, and given suggestions on ways of adapting the experience into the entire range of classroom activities. Emphasis is placed on interpretation of the regular curriculum through the five environmental strands.

Location of Sites

For further information on the locations of sites, write:

Director
National Park Service
U.S. Department of the interior
Wash., D.C. 20240

Midwest Region
National Park Service
1709 Jackson Street
Omaha, Nebr. 68102

Northeast region
National Park Service
143 South Third St.
Philadelphia, Pa., 19106

Southwest Region
National Park Service
P.O. Box 728
Santa Fe, N. Mex. 87501

National Capital Parks
National Park Service
1100 Ohio Drive, S.W.
Wash., D.C. 20242

Western Region
National Park Service
P.O. Box 36063
San Francisco, Calif. 94102

Southeast Region
National Park Service
Federal Building
P.O. Box 10008
Richmond, Va., 23229

Northwest Region
National Park Service
Room 931
4th and Pike Building
Seattle, Wash. 98101

Materials and Cost

A general guide book to help schools establish and operate such programs is:

Man and His Environment, An Introduction to Using Environmental Study Areas, Washington, D.C.: National Education Association, 1201 Sixteenth Street, N.W., $1.75.

Evaluative Data

Approximately 3 years of field testing have been done, involving teachers and students. Revisions and modifications in the programs have been made based on these tests.

OUTDOOR AND ENVIRONMENTAL EDUCATIONAL PROGRAM

Eastern Montana College And Billings (Montana) School District # 2

Directors:	Erick Erickson, Principal Eastern Montana College School and Associate Professor of Education Eastern Montana College
	Wilson F. Clark, Chairman, Division of Science and Mathematics Eastern Montana College
Program Address:	Outdoor and Environmental Education Program Eastern Montana College Billings, Montana 59101
Grade Level:	6 (K-12, long-range plans)
Subject Area:	Environmental education

Overview

The Billings Outdoor and Environmental Education Program began in 1967 as a cooperative project between Eastern Montana College and Billings School District #2. It has grown from involving only one sixth-grade classroom in 1967 to involving 33 sixth-grade classrooms in the spring of 1971. The program is somewhat unique in that during its first 5 years of operation it was totally funded through the Parent-Teacher Associations of the participating schools. The program is based on a well-stated concept of environmental education which views the task of the schools as one of helping to attack the "root causes" of environment problems—attitudes and actions rather than the "symptoms"—such as specific pollution problems. So far, the developmental

work has focused only on the sixth grade, but long range plans are projected for expanding the program through the K–12 curriculum.

Rationale and General Objectives

The 1971 progress report on the program states that the underlying philosophy is much broader than that indicated by the traditional usage of such terms as "conservation education" or "outdoor education." The environmental difficulties faced today, such as air pollution, water problems, urbanization and its consequences, and land use problems are actually symptoms resulting from much deeper "root causes." The "root causes" lie in attitudes and patterns of action. There are very few areas in which adequate technical knowledge is not available for making "significant progress towards solution." The lack lies in the willingness to use that knowledge.

The role of the schools in helping to remedy the difficulties at the heart of man's discordant relationships with the natural environment lies in helping students to "understand their total environment," to "learn (through investigations of problems on their level) how to find out about the essential ingredients of problems," and to "develop the attitudes and abilities that lead to responsible citizenship exercised in actions to contribute to solving problems." The Billings program designates four specific categories of long-range educational objectives to accomplish its environmental education tasks. They are to help students become:

1. *Knowledgeable* concerning their total environment (biological, physical, social, cultural, economic).
2. *Skillful* in how to ferret out the significant aspects of a problem or situation.
3. *Sensitive* to their own role in and responsibility to developing a productive and liveable environment.
4. *Motivated* to work constructively towards the solution of environmental problems.

Description of the Program

At present the Billings program focuses on only the sixth grade, though eventually it is hoped that it will be expanded for K–12 (and even possibly K–16). The sixth-grade program includes several components: teacher training, camp counsellor training, backup instructor training, precamp preparation of sixth graders, and camp sessions for sixth graders.

The teacher training component involves five evening sessions, one Saturday session, and a 2-day camp experience. These include both discussions of the program and its activities, and practice in the instructional and investigation programs to be carried on at the camp for sixth graders. College students training as camp counsellors and backup instructors also attend these workshops. The workshops carry credit; and in the five conducted since the beginning of the program, a total of 238 teachers, counsellors, and instructors have been trained.

The focal point of the program is the 2-day camp experience for the sixth graders. This is preceded by in-class preparation by trained teachers in which the children become familiar with the basics of simple environmental systems. This precamp preparation is considered an essential ingredient of a successful camp experience. The 2-day camp experience itself includes field instruction in four basic areas (ecosystems studies, geological studies, geographic studies, and plot studies) and experience in four other areas (first aid, art, recreation, and music and dramatics).

In addition to the above-mentioned components of the overall sixth-grade program, the progress report mentions several other crucial elements which should not be overlooked in replicating the program—the details of camp management. This includes such things as coordination of personnel, establishment and enforcement of regulations and camp routines, making cabin assignments, handling cleanup and mess procedures, and acquiring the services of a camp physician.

Cost

The per-pupil cost of the camp sessions has decreased since the first year of operation and is now $11.07. During the 5 years of the program, no Federal, State, district, or college monies have been budgeted for the program; financing was provided by several of the city's Parent-Teacher Associations. Data on the sources of funds for the training workshops

and for payment of the central staff of the program were not provided in the report.

Evaluation

To date the program seems to be extremely successful, as indicated in its rapid growth and the enthusiasm of students, parents, and teachers. On the basis of feedback collected on post-workshop evaluation forms, the teacher and college student training objectives have been met. The program, however, has done little to evaluate the children's growth in understanding, sensitivity, and skill; and the progress report states that "This is an omission we hope to correct."

NATURAL RESOURCE USE IN OUR ECONOMY

Joint Council on Economic Education
New York, New York

Authors:	William H. Stead and George L. Fersh
Project Address:	Joint Council on Economic Education 1212 Avenue of the Americas New York, New York 10036
Publisher:	Joint Council on Economic Education 1212 Avenue of the Americas New York, New York 10036
Publication Date:	1960
Availability:	From publisher
Grade Levels:	Teacher material for use in grades 3–12
Subject Area:	Economics

Overview

This teacher's reference and guide grew out of several years' experience during the 1950's bringing economic principles to the attention of conservation educators.

Required or Suggested Time

No time dimensions are given. Suggested activities at the elementary level could take 2–4 weeks. Activities at the junior and senior high school level could take 4–8 weeks.

Intended User Characteristics

Suggestions are intended for the full range of students. No special suggestions are given for particular groups.

Rationale and General Objectives

The objective is to give the teacher enough information and understanding of the economics of resource use and management so that he can incorporate this knowledge into the material taught. An economically literate public is felt to be crucial to sound economic policy formation.

Content

The guide provides brief statements concerning the rate of resource use, shortages, the nature of energy, renewable and exhaustible resources, technology, economic problems, and public policy questions. Broad aspects of environmental impact are not included.

Teaching Procedures

Discussion questions under the heading "Thinking and Talking It Over" appear after each subject presentation. A concluding section, "Generalizations and Classroom Learning Activities," contains four pages of suggestions for elementary and 23 pages for secondary grades.

Materials and Cost

Teacher's Materials:
Reference guide, 88 pp., $1.25.

Evaluative Data

Not available.

OUR MAN-MADE ENVIRONMENT, BOOK SEVEN

Group for Environmental Education, Inc.
Philadelphia, Pennsylvania

Directors:	Alan Levy William B. Chapman Richard Saul Wurman
Project Address:	Group for Environmental Education 1214 Arch Street Philadelphia, Pennsylvania 19107
Publisher:	Same as project
Publication Date:	1970
Availability:	From project
Grade Levels:	4–11
Subject Areas:	Environmental education, interdisciplinary

Overview

Book Seven of *Our Man-Made Environment* was developed in cooperation with the Division of Art Education, School District of Philadelphia, and the Philadelphia Chapter of the American Institute of Architects. The unit is an attempt to help children begin to become aware of the man-made environment—that is, to understand what constitutes a man-made environment, for what purposes this environment has been created, and how man can, in the future, improve upon it. In short, the emphasis is on sensitizing the observer to the influences of the man-made environment on his life and, if he is dissatisfied with it, helping him to understand his responsibility in changing the situation.

Required or Suggested Time

This program is designed for use as a unit within an environmental education course. It may be used in language arts, fine arts, social studies, or mathematics courses. There are 17 complete exercises, each taking about 25 minutes of classroom time to accomplish.

Intended User Characteristics

The materials are most suited to the urban, poverty-area youth of mixed ethnic background. However, the materials have been successfully used with upper-middle-class suburban children as well. It has been very successfully used with slow learners, particularly in the higher elementary grades. It has also been successfully used in junior high, high school, and college classes.

Rationale and General Objectives

The authors of this kit were concerned that students have not developed feelings of efficacy in influencing the man-made environment, and because of this, the students have felt little or no responsibility for it. In order to change the man-made environment, man must understand his role as both a creator and a controller of it. The general objective of the kit is to sensitize the student to the man-made environment and help him reach rational judgments about how it should be changed to be more closely attuned to his value systems. The four basic questions noted below under *Content* are intended to guide the student in becoming a concerned observer of the man-made environment. It is hoped that his ability to generate some well thought-out responses to the good and bad points of the built environment will be increased.

Content

Book Seven encourages students to cope with four overall questions: (1) What is the man-made environment? (2) Why do we build our environment? (3) What determines the form of our environment? and (4) How do we change our man-made environment? It is divided into four sections, each emphasizing one of these questions. Each section is composed of a series of problem-solving exercises for the student. The techniques necessary to solve some of the problems posed encourage the student to think in terms of architectural structure, cost of building materials, the relationship of the building to the surrounding community—both man-made and natural, the problem of engineering, and the social attitudes which affect the problem.

Teaching Procedures

Problem-solving exercises are offered throughout the four sections of the kit; "punch-out" models of shapes, designs, and configurations are provided; several simulations are suggested; and short readings deal with each of the four basic questions. The kit suggests that teachers not limit themselves to the activi-

ties provided, but expand both the content and teaching strategies. The relationship between the "punchouts" and the narrative description is carefully developed and will motivate students to investigate the relationship between design and the man-made environment.

Materials and Cost

The kit contains three components—a set of readings to be used by both teacher and student, 10 "punchout" cards, and seven sheets of tracing paper.

Student and Teacher Materials:

Our Man-Made Environment Book Seven. 80 pp., 9½" x 11¾", stapled papercover.
25 booklets or more, $1.50 each.
25 sets of replacement "punchouts" and tracing paper, $12.50 per set.

Evaluative Data

The materials were tested in the Philadelphia public schools in grades 6, 7, and 8. They were revised according to the data gathered and *Book Seven* now represents a second revision.

OUR WORKING WORLD

University of Colorado
Boulder, Colorado

Director:	Lawrence Senesh Professor of Economics University of Colorado
Project Address:	970 Aurora Avenue University of Colorado Boulder, Colorado 80302
Publisher:	Science Research Associates 259 East Erie Street Chicago, Illinois 60611
Publication Date:	1967 (Revised edition projected for March 1973)
Availability:	From publisher
Grade Levels:	2–3
Subject Areas:	Economics core, multidisciplinary social sciences

Overview

The *Our Working World* series is designed to introduce children to the fundamental principles which underlie the functioning of the social world and to relate children's experiences to these principles. Although economics is the core discipline, the other social sciences are an integrated part of the program. The program is designed to introduce children to the analytical tools of the social sciences, their use in discovering cause-effect relationships in society, and the order that underlies our seemingly chaotic world. The child's experiences with the real world are used as points of departure. In the second-grade materials, the children study many kinds of neighborhoods, populated by real people who have likes, dislikes, problems, and hopes. A wide variety of materials and activities is available.

In the third-grade program, children are involved in studying the problems of the city. The intent of these materials is to motivate the children to discover the causes of the major problems that cities face. The children learn what individuals, individual volunteers, volunteers working in groups, and citizens working through the political process can do to solve urban problems.

Required or Suggested Time

The course is intended to furnish a full year's work in the social studies. Individual lessons may, however, be taught separately and out of sequence.

Intended User Characteristics

These materials are intended to be used with second- and third-grade students who have listening skills and are able to read at a second-grade level or above. For inner-city pupils the materials can be used at upper elementary grades. It would be beneficial for the teacher to have a background in economics or the social sciences and to be able to direct discussions in these areas.

Rationale and General Objectives

The purpose of social science education, the author believes, is to develop analytical thinking

and problem-solving ability. Students should learn to analyze and understand the structure and processes of society, so that as adults they can participate intelligently in the decisions of a free society.

The rationale for studying the neighborhood in the second-grade from the point of view of the social sciences is that, although the neighborhood is small, it presents in microcosm the major forces in our society. For the third-grade materials the author states that, because seven out of 10 persons in this country live in a city, it is important to introduce the children to the realities of urban life. The general objective is to help children develop modes of analytical thinking useful in understanding the structure and processes of cities.

Content

The materials presented in this series use economics as a core around which the other social science disciplines are clustered. In order to teach something about all the social science disciplines in each year of study, the author has developed the idea of "orchestration" of the disciplines. Under this concept each unit emphasizes a different area of the social sciences. Also developed is the idea of the "organic curriculum," meaning a well-articulated structure of concepts and relationships that are presented in increasing depth and complexity as the child progresses from grade level to grade level.

In the second-grade the pupil becomes acquainted with neighborhoods and their many social aspects. The children study the scarcity conflict and how the neighborhood tends geographically, technologically, and occupationally to specialize in order to solve this problem. In one unit the students explore the question of changing neighborhoods by examining how land use, natural disasters, and man-land relations affect the neighborhood. In the grade three materials a multidisciplinary approach is used. The discipline of economics helps the children understand why cities are located where they are, how people earn their livelihood, why and how cities trade, and why some cities grow and others decline. Political science helps the children understand how cities are governed, how use of the land is controlled by rules and laws, and why city governments must worry about such things as poverty, discrimination, and the education of children and adults. The analytical tools of sociology help the children discover what brings people together and what drives them apart in the city. Anthropology helps their understanding of urban life by showing them how tradition hinders the acceptance of new ideas and how science and technology challenge traditional ways. Finally, the analytical tools of geography, including maps, help students understand how geographic forces dictate the location and trade patterns of cities.

Teaching Procedures

The materials stress the use of a wide variety of techniques and strategies for teaching a given concept. There are many stories and poems included in the student's text of readings and in the teacher's resource unit. Many simulations, dramatizations, role-playing activities, and other activities are suggested in the resource unit, to be used to reinforce and enrich the case studies presented by the recorded lessons in grade two and in the text for all grades.

Records are an integral part of the second-grade materials, and records and coordinated filmstrips are supplementary to the third-grade materials. In grade two it is suggested that the teacher open the lesson by playing the appropriate record while the pupils look at the two-page illustration. Then the children take an imaginary trip while looking at two pages of sequential photographs. Next a short story is read by the children, and finally consideration is given to what has been learned. The suggested procedure in the third grade is to have the children first read a concept unit to get an idea of important aspects of a city, after which the teacher raises questions for discussion. Next, in order to help the children discover characteristics of cities in real life situations, the teacher has the pupils read a case study, followed by an inquiry into the nature of the city. The teacher then reads a poem or short story to the children and concludes with a discussion. If the teacher so desires, he can reinforce what was learned in the sequence with role-playing activities, games, plays, and other exercises from the resource unit.

Materials and Cost

Grade 2:

Student Text: *Our Working World: Neighbors at Work*. By Lawrence Senesh. 191 pp., 10¼" x 8¼", clothbound, $3.45.

Student Activity Booklet: *Our Working World: Neighbors at Work*. 63 pp., 11" x 8¼", stapled paper cover, 79 cents.

Teacher's Resource Unit: *Our Working World: Neighbors at Work*. 296 pp., 11⅓" x 8¾", spiral bound paper cover, $5.25.

Record Album: 12½" x 11½" x 2"; fifteen 33⅓ rpm records; looseleaf binder; record transcript booklet, 46 pp., 8" x 10", $25.

Grade 3:

Student Text: *Our Working World: Cities at Work*. By Lawrence Senesh. 287 pp., 10-1/6" x 8", clothbound, $3.75.

Student Activity Booklet: *Our Working World: Cities at Work*. 80 pp., 11" x 8¼", stapled paper cover, 87 cents.

Teacher's Resource Unit: *Our Working World: Cities at Work*. 263 pp., 11½" x 8¼", spiral bound paper cover, $5.25.

Record-Filmstrip Set: Twelve 33⅓ rpm recordings; 12 coordinated filmstrips; record transcript booklet, 49 pp., 8" x 10"; set contained in a 21" x 10" x 2" cardboard carton, $90.

Evaluative Data

Not available.

PARKWAY PROGRAM

Philadelphia, Pennsylvania

Director: Mrs. Lisa Strick
Franklin Institute
20th and the Parkway
Philadelphia, Pennsylvania
19103

Program Address: Parkway Program
School District of
Philadelphia
c/o The Franklin Institute
20th and the Parkway
Philadelphia, Pennsylvania
19103

Grade Level: Secondary

Subject Area: All subjects

Overview

Developed in 1969 as an alternative to traditional schools, the Parkway Program is a "school without walls." Supported by the Philadelphia Public Schools and cooperating institutions in Philadelphia, the program has grown in size and has been a model for several other experimental city schools.

Rationale and Objectives

The Parkway Program was established to change students' attitudes about learning: to make them feel learning can be both enjoyable and profitable; to provide the student with the right to make decisions about his education; and to provide a curriculum with closer relationships to the community and to the problems of the current society. Further, the school was designed to maintain the identity of the student and close contact between teacher and student.

The school also was established to test the hypothesis that this type of education could be provided at a cost equal to or less than a traditional education program.

Description

The school is organized around units of students of approximately 180 students each. Each unit has its own staff and develops its own curriculum. As the school expands, additional units are added. While the school occupies no buildings, there is a central office headquarters.

The curriculum for the program is designed around five areas: (1) faculty offerings (courses offered in interest areas of staff); (2) institutional offerings (courses offered by participating institutions such as museums, companies, etc.); (3) tutorials (basic requirements which are taught by unit staff members to small groups of students); (4) management groups (groups of students and staff formed to solve specific problems); and (5) town meetings (meetings held with the entire staff and student body of the unit). These areas are designed so

that a student can complete graduation requirements, but also have alternative educational choices and a role in deciding what these choices should be.

Materials

Information regarding materials developed or used in the program should be requested from the program director.

Evaluation

The program has received continuous evaluation by both staff and students. Formal evaluation by staff and students usually occurs three times per year. As a result of the evaluation, the program has been modified in at least two ways: (1) procedures have been changed and (2) courses have been added, modified, or abolished. Student satisfaction appears high.

Program costs indicate that the program is being operated for no more than the cost of a traditional school in the same area.

PLANNING FOR CHANGE

Center for Urban Education
New York, New York

Director:	Frank E. Brown Center for Urban Education
Project Address:	105 Madison Avenue New York, New York 10016
Publisher:	Project
Publication Date:	1970
Availability:	From project
Grade Levels:	4–6
Subject Areas:	Political science, urban planning

Overview

The *Planning for Change* curriculum is designed primarily for use in inner-city schools. Its purpose is to produce an awareness that the urban environment is a result of human decisions and can be influenced by human action. The Center for Urban Education hopes to make school more relevant to inner-city youngsters by using a multi-media approach to the study of the immediate neighborhood, by encouraging participation in action programs aimed at changing the neighborhood, and by relating both the affective and cognitive domains in their learning activities. Though *Planning for Change* is based on New York City, the center staff intended the suggested program to be viewed as a model or guide which could be adapted to a variety of neighborhoods and cities.

Required or Suggested Time

The entire *Planning for Change* curriculum is designed for a full year or 32-week sequence. However, it is a flexible program, with Units I and II providing the essential core sequence. The other six units may be shifted around, deleted, or elaborated as fits the needs of the particular class.

Intended User Characteristics

The materials were originally developed for use at the junior high level, but in their present form have been adapted for higher elementary. They are particularly appropriate for urban poverty area and working class students of mixed ethnic background, but might be used with some adaptation to help students from more fortunate neighborhoods understand the problems of the inner city. The curriculum is particularly designed for use in New York City, but can be adapted for other urban areas. This, of course, would require additional preparation time on the part of the teacher.

Rationale and General Objectives

The developers believe the study of planned change should start as early as possible, since many potentially useful but controversial remedies for our urban problems lie in a vastly increased urban renewal and social service operation, and these cannot be implemented without effective understanding and participation of knowledgeable citizenry. The overall objectives of the *Planning for Change* curriculum are to develop the skills necessary for "effective involvement in planning and rehabilitating neighborhoods," and to increase the student's sense of self-worth as an effective member of his community.

Content

The curriculum includes eight units, the first two of which are considered essential, and the last six which may be used selectively and in various sequences. The major sequence is Unit I, "The Neighborhood," and Unit II, "Neighborhood Problems." The minor sequence includes Units III and IV, which deal specifically with New York City; Unit V, "What Does a Big City Have to Offer?"; Unit VI, "History of Your Neighborhood"; Unit VII, "Urban Design"; and Unit VIII, "Future Planning." The units deal with a variety of urban problems, both physical and social; and the emphasis, of course, is on planning.

Teaching Procedures

The curriculum employs a wide variety of teaching strategies and resources and to an unusual degree stresses student participation in action programs to effect desired changes in the neighborhood. The instructional guidelines for each activity include a general description of the aim(s) of the activity; specific statements of aims in the categories of attitude formation, skills, and knowledge; a list of the materials needed for the activity; a suggested motivational technique for opening the activity; and detailed procedural instructions.

Materials and Cost

The *Planning for Change* curriculum includes a Teacher's Manual, a Student Workbook, and a variety of resources, including slides, pamphlets, tape recordings, maps, and newspapers. Many of the resources are not furnished by the project and must be collected by the teacher for they will differ from city to city.
Student Workbook:

Planning for Change: A Book about New York City and How to Change It, 213 pp., 8½" x 11", mimeographed. New prices not yet available.

Teacher's Manual:

Planning for Change: Urban Politics and Neighborhood Planning, 264 pp., 8½" x 11", mimeographed. New prices not yet available.

Evaluative Data

Not available.

PROJECT I-C-E (INSTRUCTION—CURRICULUM—ENVIRONMENT)

Green Bay, Wisconsin

Director:	Robert J. Warpinski
Project Address:	1927 Main Street Green Bay, Wisconsin 54301
Grade Levels:	K–12
Subject Areas:	Language Arts, social studies, science

Overview

Project I-C-E was originated under the Elementary and Secondary Education Act, title III, by the Wisconsin Department of Public Instruction in 1969. A four-member committee was formed to assess needs and prepare a proposal. The operational proposal was effective in July 1970; teacher committees functioned from January through May 1971, and a 3-week summer institute-workshop was conducted in July 1971 to complete guide development. Currently, implementation activities are being conducted in pilot areas.

Rationale and General Objectives

The overall purpose of the project is to improve instruction and curriculum, using environment education as a vehicle. Specific objectives are as follows:

- To develop a supplementary Environmental Education Guide, K–12, for all discipline areas
- To develop and maintain an environmental education resource center
- To develop and support community resources

Description of the Program

Supplementary environmental education guides in social studies, language arts, and science for grades K–6 and 7–12 have been developed, as have "Environmental Concerns Inventories" for K–4, 5–8, and 9–12. In addition, a teacher document, "Twelve Major Concept Categories—Their Rationale," has been produced. A project brochure is available free from the project.

Guides have been distributed to 53 school districts and about 100 nonpublic schools. Over 3,000 teachers currently are using the materials. Several pilot schools have been identified.

Consultative, inservice, and preservice programs are available to teachers. In addition, teacher committees for guide development spent 10 work sessions of 2–3 hours each during evenings.

Future Plans

K–12 Environmental Education Guides are being prepared for mathematics, fine arts, physical education, home economics, industrial arts, business education, and agriculture. Among planned future activities are continued guide development and revision where necessary, continued resource center development, and emphasis on community support and resources. The Project Resource Center serving area schools, still in the early stages of development, may be visited by those interested.

Materials and Cost

Teacher's materials:

Twelve Major Concept Categories—Their Rationale

Student materials:

Supplementary Environmental Education Guides, for social studies, language arts, and science for grades K–6 and 7–12.

Environmental Concerns Inventories, for grades K–4, 5–8, and 9–12.

Complete series of 39 booklets—$5.

Evaluation

The effectiveness of the materials has not as yet been evaluated; this is part of the present year's task.

PROVIDENCE SOCIAL STUDIES CURRICULUM

Rhode Island College
Providence, Rhode Island

Director: Ridgway F. Shinn, Jr.

Project Address: Rhode Island College
Providence, R.I. 02908

Publisher: Rhode Island College
Bookstore
600 Mt. Pleasant Avenue
Providence, R.I. 02908

Publication Date: 1969

Availability: From publisher

Grade Levels: K–12

Subject Areas: History, geography

Overview

This K–12 curriculum represents an interdisciplinary approach to social studies, utilizing geography (1–8) and history (9–12) as the organizing disciplines. Primary reliance is placed on commercially available texts, pamphlets, and audiovisual aids, etc., which are coordinated to the resource units which the project has prepared. The curriculum is based on a new-world view of society in which the students are expected to examine the human condition from a broad global perspective.

Required or Suggested Time

Each curriculum guide provides firm suggestions for the timing of individual units; however, a school system could use and adopt selected portions of the curriculum.

Intended User Characteristics

The materials have been designed particularly for the inner-city disadvantaged child. They do not seem appropriate for the slow learner. Teachers would benefit if given inservice training.

Rationale and General Objectives

The developers feel that the inner-city child often has been presented irrelevant materials which encompass values which are substantially at odds with the values of his own subculture. He is also often taught by teachers with negative attitudes toward him. After an extensive appraisal of the demographic characteristics of Providence, materials were designed which have high motivational impact because they reflect the students' needs and interests. Students are expected to gain in both the cognitive and affective domains. Examples of stated

objectives are to develop an understanding of the world, democratic values, and worth of the individual. Students are also expected to develop adequate social studies skills.

Content

The units from grades four, ten, eleven, and twelve seem the most useful to supplement an environmental education course. Grade 4, "A Type Study of Regions," includes the "Overview"; "The Nature and Characteristics of Metropolitan Regions"; "Regions of Extractive Economic Activities"; and "Regions of Manufacturing Activity." Grades 10 and 11 cover "American Studies," and include "Growth and Territorial Growth in the United States," "Development of Society in the United States," "The Development of the United States' Economic System," "United States Political Development," and "United States in the Contemporary World." Grade 12, "Issues in Contemporary Societies," deals with "Development Issues," "Power Issues," and "Social Issues."

Teaching Procedures

The concepts, aims, and skills which the curriculum intends to develop are stated for the teacher along with suitable questions to assist the students in reaching what are considered to be the important generalizations. Teachers are cautioned to treat the materials openly and to answer student-generated questions as fully as possible. The pace of the class and the particular materials and activities chosen are left to the discretion of the teacher, depending on the needs of the class.

Materials and Cost

All of the materials are mimeographed and staple-bound, with a paper cover.

Kindergarten
Curriculum Guide, K–3, and Resource Units, K, $2.95.

Grade 1
Curriculum Guide, K–3, and Resource Units, 1, $2.95.

Grade 2
Curriculum Guide, K–3, and Resource Units, 2, $2.95.

Grade 3
Curriculum Guide, K–3, and Resource Units, 3, $3.50.

Grade 4
Curriculum Guide, 4–7, and 4 Resource Units, $6.45.

One copy of each Curriculum Guide and all Resource Units, K–12, $52.80.

Grade 5
Curriculum Guide, 4–7, and 6 Resource Units, $8.80

Grade 6
Curriculum Guide, 4–7, and 6 Resource Units, $8.80.

Grade 7
Curriculum Guide, 4–7, and 4 Resource Units, $6.45.

Grades 8 and 9
Curriculum Guide, 8–12, and 7 Resource Units, $10.25.

Grades 10 and 11
Curriculum Guide, 8–12, and 6 Resource Units, $9.

Grade 12
Curriculum Guide, 8–12, and Resources for 15 Issues, $5.25.

Evaluative Data

The data indicate that students in the Providence schools who used this material had much more positive attitudes toward social science than students in a control group. There is some evidence that the curriculum works better with above-average students than with slow learners.

REGIONAL ENVIRONMENTAL EDUCATION PROGRAM

Yarmouth, Maine

Director:	Wesley H. Willink
Project Address:	McCarthey Street Yarmouth, Maine 04096
Grade Levels:	K–6
Subject Area:	Environmental Education

Overview

Designed to develop a comprehensive program in environmental education, this project is modeled after the Conservation and Outdoor

Education Program of the Ann Arbor, Michigan, School System. Funded from monies available through title III of ESEA, the program is designed to serve a regional area.

Rational and General Objectives

This program focuses on developing attitudes toward study environments, their biological and physical elements, and their associated environmental problems. The study environments were selected to provide for expanding both the scope and complexity of understandings to be developed. At the kindergarten-grade one level, the school environment is emphasized; at grades two and three, the neighborhood; at grades four and five, the community; at grade six, the region.

Although there is an environmental emphasis at each grade level, the study environments are treated with reference to the ways in which they relate to the other environments studied. Twelve environmental themes have been developed for study with each of the environments. Six of the themes deal with the natural environment: land, water, air, plants, animals, and energy. Six concern the man-made environment: land and water development, structural design, transportation, utilities, recreation, and pollution and pest control.

Description

The program involves (1) a classroom presentation by an environmental education coordinator relating to the study environment and providing a field trip orientation; (2) a field trip around the study environment with the students in small groups; and (3) followup investigations, environmental planning, and activities with consultation provided by the coordinator when and where needed.

Teacher's guides are available for each grade level. They include the theme, teacher background information, suggested field trip interpretive technique, and suggested followup activities. An environmental education resource center has been established which contains additional teaching materials and special equipment for teachers and students. Consultants are also available to help teachers and students develop their school sites as outdoor learning centers. Inservice and preservice teacher education workshops are conducted for teachers interested in using the environmental education materials and program.

Materials and Cost

Teacher materials:

Environmental Education Program—Organization and Operation, by Dean B. Bennett, 1969.

Evaluative Data

The materials and activities have been field tested and revised during development and implementation of the program. Data are not available at this time.

REGIONAL MARINE SCIENCE PROJECT

Carteret County Public Schools
Beaufort, North Carolina

Director:	Will Hon
Project Address:	Rivers Island Beaufort, N.C. 28516
Grade Levels:	4–12
Subject Area:	Science

Overview

The Marine Science Project is designed as "an examination of a region's attitude toward a sea that embraces it physically, culturally, and economically." Developed initially under title III, ESEA, the project now receives financial support from the State of North Carolina because materials developed will be utilized on a statewide basis. Designed to cause coastal people to think about the changes time and progress will bring to the coastal region, the program is aimed at the public schools, specifically grades four through twelve.

Rationale and General Objectives

The major orientation of the program is ecology. The field trip is used as the primary instructional strategy. Classroom presentations and activities are employed but are geared to the field experiences. The program involves the

development of a curriculum, including teaching units and field trip guides for grades 4–10 and for two advanced biology courses as well as other special publications. It also involves a program of teaching and inservice training to help develop, test, and use the curriculum materials. A third program objective is the development of an education center, in the form of a facility to serve as interpretive center, demonstration area, field trip nucleus, laboratory, reference library, and information center.

Description

Three-week teaching units have been, or are being, prepared for grades 4–10 to supplement existing science instruction. Each unit includes student text and classroom exercises, additional notes for teachers, guides to films and reference materials, tests, and answer sheets.

Each unit is designed to culminate in a field trip. Teachers are provided with basic information and a special guide on conducting the field portion of the unit. The units are designed to fit into the existing curriculum and to replace sections of current materials.

The philosophy of the field trips is to set up discovery-type situations in the form of complex problems for group investigation. The class is taken to a marine community. The leader then guides the class in looking at the area and asking questions about what makes it function as a natural community. After several thought-provoking questions have been raised, the class breaks into small groups to explore and gather data to use in answering the questions. After collecting, measuring, and observing, the groups reconvene as a total class and present their problems and discoveries and defend their explanations. The strategy is to guide the students at arriving at their own explanations which, although perhaps not technically exact, are usually quite adequate.

Consultant services are available to teachers using the materials. Preservice and inservice teacher education programs are established. Workshops of 2½ days are conducted as well as occasional Saturday classes. In addition, workshops are hosted for sponsoring agencies such as universities.

Materials

	Grade
A Tour of Mudflat Town*	2
A Day with Don at Cape Lookout Seashore	3
How Sea Animals Live	4
Living Communities of the Seashore	5
Bogue Sound Treasure Hunt	5
The Ocean and Modern Mad	6
Port: Gateway to the World Ocean	6
Salt Marsh, Sound and Sea Beach*	7
The Sea and its Boundaries*	8
The Field Approach to Coastal Ecology*	10
Marine Ecology	11–12
Experiments with Sea Water	11–12
Dune Detective	11–12
The Field Experience	all grades
Marine Science Film Catalogue	all grades
North Carolina: Our Role at the Edge of the Sea	all grades
The Major Natural Communities of the Carolina Coast	all grades
A Checklist of Molluscs of N.C.	all grades
The Regional Marine Science Project	all grades

* Teacher supplement available

Evaluative Data

Evaluation is primarily based upon feedback from teachers and students. Emphasis is placed upon self-directedness and self-evaluation by students and involves students in designing instruments for purposes of determining attitudes and understandings.

SCIENCE CURRICULUM IMPROVEMENT STUDY (SCIS)

University of California
Berkeley, California

Director:	Robert Karplus
Project Address:	Lawrence Hall of Science University of California Berkeley, California 94720

Publisher:	Rand McNally & Company
Publication Date:	1968 through 1970
Availability:	From publisher
Grade Level:	Elementary
Subject Area:	Science

Overview

SCIS was established in 1962 by Karplus as a result of his work with the Elementary School Science Project (ESSP). That experience led Karplus to the conclusion that science had to be simplified for the elementary school and organized on a different basis from traditional logical subject matter presentations. Using the groundwork of Piaget, Bruner, and others, Karplus concluded that the elementary school years should provide:

- A diversified program based heavily on concrete manipulative experiences.
- These experiences in a context that helps to build a conceptual framework.
- A conceptual framework that permits children to perceive phenomena in a meaningful way.

Thus, SCIS has considered cognitive, affective, and psychomotor domains.

Required or Suggested Time

No specific time dimensions are given for the various units, though guidelines recommended for various studies encompass time dimensions from one to several weeks. Recommendations are made for sequencing and grade-level placement.

Intended User Characteristics

Materials are designed for the full range of elementary students. No particular suggestions are given for varying ability levels.

Rationale and General Objecitves

Among the objectives of SCIS are intellectual development, scientific literacy, decisionmaking, and the development of favorable pupil attitudes toward science. The belief that the concept of literacy is the principal objective of teaching science in the elementary school permeates the entire program.

Content

As indicated above, SCIS is primarily an elementary science program which might, if completely implemented, comprise the total science program through the elementary years. The concepts around which the materials have been developed are representative of the "big ideas" of science, including organism, ecosystem, matter and energy, property, reference frame, system, and model. Thus a conceptual framework is organized, cutting across traditional disciplines and forming a structure that illustrates the unity of the sciences. Physical and life science sequences are developed in parallel modes.

With respect to environmental education materials, the last four segments of the life science sequence are of interest: Populations, communities, environments, and ecosystems.

For each, both student booklets and teacher guides are available, along with materials kits for student use in carrying out activities. As might be suspected, emphasis is laid on psychomotor approaches to develop both concepts and attitudes. Specific activities are recommended and developed to "fit" into the total scheme.

Teaching Procedures

As indicated above, the normal approach to learning is through student activity. Use of the teachers' guides becomes essential.

Materials and Cost

Population. 1967, 8½" x 11"; paperbound, stapled; Teacher's Guide, $2.

Environment. 1968, 8½" x 11"; paperbound, stapled; Teacher's Guide, $3. Student's Guide, 65 cents.

Communities. 1971, 8½" x 11"; paperbound, stapled; Teacher's Guide and Student's Guide, each $2.

Ecosystems. 1971, 8½" x 11"; paperbound, stapled; Teacher's Guide and Student's Guide, each $2.

Evaluative Data

A number of studies have been conducted, some of which have resulted in modifications of program and materials. Generally, the studies indicate positive results of SCIS with respect to the meeting of its objectives.

SLOW LEARNER PROJECT

Carnegie-Mellon University
Pittsburgh, Pennsylvania

Directors:	Edwin Fenton Anthony N. Penna
Project Address:	Social Studies Curriculum Center Carnegie-Mellon University Schenley Park Pittsburgh, Pa. 15213
Publisher:	Holt, Rinehart, and Winston, Inc. 383 Madison Avenue New York, New York 10017
Publication Date:	Summer 1972
Availability:	From publisher
Grade Level:	9
Subject Area:	Urban studies

Overview

Americans in Cities is a 1-year urban studies course designed for the ninth-grade slow learner. The program emphasizes the affective domain and concentrates on improving a healthy self-concept, while strengthening study and analytic skills. Primary sources, newspaper accounts, maps, etc., are utilized to teach necessary concepts and various aspects of urban life.

Required or Suggested Time

The course is divided into 18 chapters, each requiring approximately 2 weeks of class time. The lessons are ordered chronologically and should be taught sequentially.

Intended User Characteristics

The materials were written for the ninth-grade slow learner between the ages of 14 and 16 with a reading level between the fourth and seventh grades and an IQ between 75 and 90. The teacher needs a background in social studies and a sympathetic attitude toward slow learning students who are alienated from learning and school.

Rationale and General Objectives

The developers feel that slow learners can learn when learning tasks are appropriate to their abilities and aspirations. These learners have special characteristics which become clearly apparent when they must cope with the traditional, narrative text and the lecture-recitation approach to teaching social studies. Frustrations quickly arise with difficult vocabulary, reliance on the printed word, and the use of high level abstractions and generalizations. For the slow learner, then, priorities have been revised. Developing a positive self-concept, positive attitudes toward learning, clarification of values, and the development of inquiry skills are stressed before the students are given an opportunity to develop social studies skills and apply social studies terms and concepts.

Content

Americans in Cities is designed to stimulate slow learners to understand that twentieth century America has become fundamentally urban. Urbanization not only has demanded that man create new and different social economic and political patterns to deal effectively with complex human problems, but has also created greater opportunities for individual growth and achievement.

Concepts from political science, economics, geography, sociology, and history are introduced to help students examine specific aspects of urban society such as housing, public safety, transportation, welfare, and municipal government. The materials are structured to encourage students not only to inquire about the urban problem being presented, but also to identify, clarify, and develop their own personal attitudes toward the problem. Students should be able to better cope with the metropolitan environment because they understand it as highly diversified and complex phenomenon.

Teaching Procedures

Teaching strategies are centered around teacher-directed student discussion designed to facilitate learning of content, organizing of data, hypothesizing, and finally evaluating. Value discussion is considered an integral part of the classroom experience.

Materials and Cost

Materials will be available in the summer of

1972; projected costs are not available at this time.

Evaluative Data

Not available.

SOCIAL ISSUES RESOURCE SERIES

Washington, D.C.

Director:	Eleanor Goldstein
Project Address:	Exotech Systems, Inc. 525 School Street, S.W. Washington, D.C. 20024
Publisher:	Same as project
Publication Date:	January 1972
Availability:	From project
Grade Levels:	10–12 (7–9)
Subject Area:	Problems of Democracy

Overview

These volumes are two of 10 projected looseleaf volumes on social issues; each volume will have semiannual supplements. Other volumes of interest for environmental education will include "Transportation" and "Urbanization." Careful selection of articles gives a broad coverage of the topic and of opposing viewpoints. The materials are designed for flexible classroom use, stressing student initiative and teacher support in the selection of topics, formulation of questions, and analysis of data and issues.

Required or Suggested Time

Each volume is designed to take from 3 to 6 weeks, depending on the teaching methods employed, if used daily in a single class. Single articles or selections of articles can be used independently in social studies or in other courses.

Intended User Characteristics

Designed particularly for senior high students, the materials may also be used at the junior high level. If suggested teaching procedures are followed, the teacher must be willing and able to assume a role that is supportive to and facilitative of student inquiry.

Rationale and General Objectives

The author's premises include the beliefs that "the study of socially significant issues should be a central, rather than peripheral, part of the school curriculum," that periodicals "fulfill an important function in selecting, distilling, interpreting, placing in perspective, and presenting a balance of . . . subjects," and that high school students can be motivated to select and formulate their own learning activities, with the assistance of an open and supportive teacher. The major goals of the program are to develop student initiative in formulating important social questions, in analyzing and weighing data and conclusions of others, and in participating intelligently in discussions of the issues.

Content

The volume on pollution contains articles dealing with various kinds of pollution (air, water, noise, thermal, etc.), the effects of pollution (on health, wildlife, etc.), the dangers of underestimating as well as overestimating the consequences of the problem, cost of pollution and pollution control, case histories, and government policies.

The volume on population deals with the problems of both overpopulation and underpopulation, migration, the relationships of a population policy to imbalances in the power and position of minorities, food and hunger, zero population growth, population history and census data, futurism, and government policies.

Teaching Procedures

Student initiative with teacher support is suggested in selection of topics and articles, formulation of issues and questions, construction and use of models, class discussion, handling data, research, and evaluation.

Materials and Cost

Pollution volume:

Student Materials:

60 different articles in looseleaf binder, $30.

Semiannual Supplement, 20 articles, approximately $10.

Teacher Materials:

Teacher's Guide: approximately 20 pp., included with student materials.

Population volume:

Student Materials:

60 different articles in looseleaf binder, $30.

Semiannual Supplement, 20 articles, approximately $10.

Teacher Materials:

Teacher's Guide: approximately 20 pp., included with student materials.

Evaluative Data

The method and materials were developed and tested over a 5-year period in the author's classroom. No further evaluative data are available.

SOCIAL STUDIES PROJECT

Harvard University
Cambridge, Massachusetts

Directors:	Fred M. Newmann, Professor of Curriculum and Instruction, University of Wisconsin
	Donald W. Oliver, Professor of Education, Harvard University
Project Address:	Appian Way Cambridge, Mass. 02138
Publisher:	American Education Publications Education Center Columbus, Ohio 43210
Publication Date:	1967, 1969
Availability:	From publisher
Grade Levels:	7–12
Subject Areas:	Political science, history of science, ethics

Overview

The Harvard Social Studies Project has developed curriculum materials, teaching approaches, and evaluation devices based on the conviction that the analysis of public controversy should command primary attention in the teaching of social studies in public secondary schools. The project has gone through five phases in producing these materials: development of materials, experimental trial of materials, evaluation, revision of materials for publication, and systematic statements of concepts upon which the project is based.

Required or Suggested Time

The unit books each require 1 to 3 weeks, depending on the amount of discussion and emphasis placed upon them by the teacher and class.

Intended User Characteristics

The materials are intended for use as supplementary materials and can be included in any social studies course to which they apply. They are intended for all students of average ability in grades 7 through 12. Effective use of the "Socratic method" of discussion requires some thought and practice by the teacher, as well as a willingness to deal frequently with emotion-laden issues in an open and energetic manner.

Rationale and General Objectives

The most broadly stated objective is to train students to examine and analyze, through discussion and argument, the kinds of disputes which give birth to social conflict. The project developers state that, by considering a variety of situations throughout history and across cultures, by viewing the situations in terms of various social science concepts and theories, and by examining and weighing various methods for reaching and justifying positions, students will hopefully gain certain powers of analysis that will aid them in discussing value dilemmas on which public controversy thrives.

Content

Two of the unit books produced by the project, *Municipal Politics* and *Science and Public Policy,* deal with environmental issues.

Municipal Politics is designed to show that conflict is a fact of life in every American city. Whenever there is a public problem, interested groups and individuals propose different and often antithetical "solutions." The student material is a fictionalized case study in which community decisionmakers grapple with the important concept of land use. Students are expected to understand and deal with such concepts as expertise, authority, political strategy, self interest, community interest, majority of citizens, interest groups, and power elite.

Science and Public Policy contains a series of short readings, each followed by questions which serve as the basis of class discussion. The readings describe a variety of situations, both real and fictional, in which the relationships between scientists and public decisionmakers are called into question. The case studies include:

- Galileo, the Church, and Copernican theory
- Fluoridation of municipal water supplies
- Oppenheimer, nuclear research, and national security
- Chemical-biological warfare research
- Genetic research.

Teaching Procedures

Emphasis is placed on continuing dialog with students, simulation, and moderation of discussion and argument. *Taking a Stand,* the unit book which the project suggests classes use before any others in the Public Issues Series, introduces students to the elements of discussion of controversial issues. *Cases and Controversy: Guide to Teaching the Public Issues Series* provides guidelines to the teacher for conducting discussions of controversial issues, using the "Socratic method." In addition, both *Municipal Politics* and *Science and Public Policy* are accompanied by short Teacher's Guides offering specific suggestions for discussion of the two unit books.

Materials and Cost

Student Materials:

24 Unit books by Fred M. Newmann and Donald W. Oliver; each is 5" x 8", stapled, paper covered; priced at 35 cents per copy in quantities of 10 or more of one title; available from publisher. The two unit books which deal with environmental issues are:

Municipal Politics, 47 pp.
Science and Public Policy, 47 pp.

A list of other unit books may be obtained from the publisher.

Teacher's Guide:

4 pp., 8½" x 11", printed leaflet with specific suggestions for teaching strategies for the issue and 2 possible objective tests; free with order of 10 or more.

Additional Guide:

Cases and Controversy. 15 pp., 8½" x 11", stapled paper cover; describes suggested discussion techniques; 1 copy sent with each order of 10 or more copies of one title of the student materials.

Evaluative Data

The project has conducted two major types of evaluation: informal clinical evaluation of the ongoing teaching, and systematic evaluation of the program at its termination. The results of the first are reflected in the revised teaching and testing materials in the Public Issues Series. Results of the second are in the final project report. The summary of results is rather inconclusive, and the question of whether it is possible to teach average high school students to carry on intelligent discussions about social issues remains essentially an open one, subject to further examination and testing.

TILTON SCHOOL WATER POLLUTION PROGRAM

Tilton, New Hampshire

Directors: John T. Hershey
Head, Science Department
Germantown Academy
Fort Wash., Pa. 19034

Stephen P. McLoy
Teacher of Political Theory
Tilton School
Tilton, N.H. 03276

Albert L. Powers
Head, Science Department
Brewster Academy
Wolfeboro, N.H. 03894
Alan D. Sexton
Teacher of Science
George School
Newtown, Pa. 18940

Project Address: Tilton School
Tilton, N.H. 03276

Publisher: Institute for Environmental Education
2803 Scarborough Road
Cleveland Heights, Ohio 44118

Publication Date: 1971

Availability: From publisher

Grade Levels: 7–12

Subject Area: Interdisciplinary

Overview

This program originated with grants from the Ford Foundation and the Federal Water Quality Administration. The curriculum guide was the result of the cooperative efforts of high school teachers, students, scientists, and technicians. The guide takes an action-oriented approach to environmental education and draws upon several areas in the sciences and social sciences.

Rationale and General Objectives

A basic assumption underlying the program is that the student's inherent curiosity can be effectively channeled into productive activity. This "means more than what students can cover in a course; it means [that] through the process of learning students can make a significant contribution to society at large." Thus, learning is not confined to the classroom and an important aspect of the program is to step outside or expand the classroom to encompass the life space of the student. It is in this way that theory and otherwise disjointed or irrelevant facts begin to assume importance for the student.

Description

The guide is composed of various suggested activities which students may undertake. Most of these require 1½ hours to complete, although several may require considerably longer periods of time. The activities are divided into four chapters: hydrologic cycle, human activities, ecological perspectives, and social and political factors. Each activity contains seven parts: an introduction, questions regarding the activity, equipment, procedures, results obtained by using the study, limitations and problems encountered with the activity, and an annotated bibliography.

The seven appendixes at the end of the guide include a discussion of water quality parameters, aids to implementation, suggestions regarding limitations and inconveniences, suggestions related to evaluation, a bibliography, a water pollution and environmental glossary, and comments regarding laboratory and field safety.

Materials and Cost

Teacher's Guide:
A Curriculum Activities Guide to Water Pollution and Environmental Studies, Volumes I and II, $15.

Evaluative Data

In addition to feedback from teachers and students using the materials, two summer research sessions were held to allow teachers and students to test ideas, methods, and approaches. Case study results for each activity are included in the guide.

VOICES FOR JUSTICE

Committee on Civil Education
University of California
Los Angeles, California

Directors: Charles N. Quigley and
Richard P. Longaker
University of California
Los Angeles, California

Project Address: Committee on Civic Education
University of California
School of Law
Los Angeles, Calif. 90024

Publisher: Ginn and Company
Lexington, Mass. 02173

Publication Date: 1970

Availability: From publisher

Grade Level: 9 (10–12)

Subject Areas: Civics, government, problems of Democracy

Overview

All materials which have been developed by the Committee on Civic Education have been designed to assist students in developing those analytical and evaluative skills with which to understand and cope with conflictual situations. Students are expected to develop mature, complex notions about reality and, consequently, become better prepared to predict the consequences of alternative courses of action by exploring actual issues and their proposed solutions. The instructional strategy centers around an "inquiry/discovery" approach which is controlled by the technique of the teacher.

Required or Suggested Time

The materials comprise a full year's course. However, some of the content is not appropriate for environmental education.

Intended User Characteristics

Voices for Justice was written for the ninth grade. It has been used throughout the secondary grades and upper elementary grades, however, depending on the reading abilities of students. Any qualified social studies teacher who is prepared to deal openly with controversial issues can implement the program.

Rationale and General Objectives

The developers feel that it is the responsibility of the school system in a democracy to prepare analytical and knowledgeable decision-makers. By assessing their own value system in the light of conflicting values and by learning of some of the essential values of American society, students should become more tolerant of diversity and better able to manage conflict. The acquisition of intellectual skills which will enhance abilities to deal intelligently with issues is stressed, rather than large amounts of factual information.

Content

The program is made up of eight case studies chosen to provide classroom experience in discussing issues and participating in decision-making. The content of one of the cases, "Storm King Mountain," is particularly appropriate for environmental education. It is the format—role playing—rather than the content which makes this material attractive as a possible supplement for an environmental education course. The Teacher's Guide elaborates on the techniques and strategies necessary to implement the approach. Students learn to identify and describe conflicts of interests and values, to determine what kinds of information is needed to understand the problem, to develop viable alternative solutions, to appraise possible consequences, to choose among solutions, and to utilize a variety of negotiating procedures.

Teaching Procedures

It is suggested that the Socratic method, case studies, discussion, and role playing activities are suitable ways to implement the materials. No answers are given to the many controversial questions raised. The objective is to help students understand the issues, discover values and considerations that are relevant, and arrive at their own conclusions.

Materials and Cost

Student Text

Voices for Justice 6" x 9", stapled paperbound booklets. 78 pp., $1.68.

Teacher's Guide

Voices for Justice (Annotated Edition) 6" x 9", stapled paperbound booklet. 98 pp., $1.68.

Evaluative Data

The program has been extensively evaluated; however, the results have not been completely analyzed.

WAVE HILL CENTER FOR ENVIRONMENTAL STUDIES

Bronx, New York

Project Address: Wave Hill Center for Environmental Studies
675 West 252d Street
Bronx, New York 10471

Grade Level: Elementary

Subject Areas: Environmental education, conservation education

Overview

Wave Hill provides both a facility and an approach for teaching conservation and environmental education. Teacher education programs are provided on-site. Children take part in the Nature Studies Program, and self-guided tours are available for adults.

Rationale, General Objectives, Description

The purposes of Wave Hill include training teachers who will be able to teach others the "Wave Hill Method" which stresses teaching things in context and provides learning opportunities for children regarding the environment and environmental problems.

The content included in the program is interdisciplinary and capitalizes on the curiosity of children. The program stresses interrelationships of man and his environment, and focuses first on the environment inside the classroom, both the psychological and physical environments. Emphasis is also placed on having the student experience as much as possible of life outside the classroom, including both natural and man-contrived environments. A strong effort is made to have students work on projects in groups or as individuals rather than as a class.

Facilities

The center has facilities, both natural areas and classrooms, for use in the program. Arrangements can be made to visit these.

Evaluation

Activities used in the program and the methods used in the program have been tried and used successfully in several schools in New York.

INFORMATION SOURCES

A number of governmental agencies have programs relating to the environment and can supply information and materials on their specific areas of interest. These include:

Agriculture Research Service

Public Inquiries Unit, PB
Information Division, ARS
U.S. Department of Agriculture
Room 724A, FCB
Hyattsville, Maryland 20782

Atomic Energy Commission

Division of Public Information
Atomic Energy Commission
Washington, D.C. 20540

Bureau of Outdoor Education

Bureau of Outdoor Education
Department of the Interior
Washington, D.C. 20240

Department of Transportation

Office of Environmental Policy, FHWA
U.S. Department of Transportation
Washington, D.C. 20591

Environmental Protection Agency

Environmental Protection Agency
Public Affairs Office
Public Inquiries
Rockville, Maryland 20852

Environmental Science Service Administration

Environmental Science Service Administration
U.S. Department of Commerce
Rockville, Maryland 20852

Federal Water Pollution Control Administration

Federal Water Pollution Control Administration
Crystal Mall Building 2
1921 Jefferson Davis Highway
Arlington, Virginia 22203

Fish and Wildlife Service

Office of Conservation Education
Fish and Wildlife Service
Department of the Interior
Washington, D.C. 20240

Food and Drug Administration

Office of Consumer Affairs
Food and Drug Administration
U.S. Department of Health, Education, and Welfare
5600 Fishers Lane
Rockville, Maryland 20852

Forest Service

Forest Service
U.S. Department of Agriculture
South Agriculture Building
Washington, D.C. 20250

Geological Survey

Information Office
U.S. Geological Survey
Washington, D.C. 20240

National Aeronautics and Space Administration

NASA Scientific and Technical Information Facility
P.O. Box 33
College Park, Maryland 20740

National Bureau of Standards

Office of Technical Information and Publications
National Bureau of Standards
Washington, D.C. 20234

Soil Conservation Service

Educational Relations
Information Division
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C. 20250

Tennessee Valley Authority

TVA Information Office
Knoxville, Tennessee 37902

U.S. Office of Education

Office of Environmental Education
Regional Office Building
Seventh and D Street, SW.
Washington, D.C. 20202

U.S. Water Resources Council

U.S. Water Resources Council
2120 L Street
Washington, D.C. 20037

The following organizations—categorized under the headings *general, urban planning, urban development and renewal,* and *housing*—are sources of information on urban affairs.

General

Director
HUD Clearinghouse Service
Urban Management Assistance Administration
U.S. Department of Housing and Urban Development
451 7th Street, SW., Room 8210
Washington, D.C. 20410

Serves as the clearinghouse for sources of information as well as publications on the various aspects of urban development, urban renewal, housing, etc. Refers requesters to other programs.

Information Center
U.S. Department of Housing and Urban Development
451 7th Street, SW., Room 1202
Washington, D.C. 20410

Answers questions and refers requests to the appropriate offices within the U.S. Department of Housing and Urban Development. Answers questions on ongoing projects administered by the department.

National League of Cities/U.S. Conference of Mayors
1612 K Street, NW.
Washington, D.C. 20006

Answers inquiries, provides advisory and consulting services, and permits on-site use of its collections on materials on public administration and urban government. Publishes *Nation's Cities* monthly.

National Urban League
55 East 52nd Street
New York, New York 10022

Answers inquiries and provides references and literature searching services on those subjects clearly related to the urban areas. Sells bibliographies on urban problems, housing, etc.

Urban Planning

American Society of Planning Officials
1313 East 60th Street
Chicago, Illinois 60637

Answers, inquiries and provides research information and advice on planning, zoning, land use, and allied subjects. Provides consulting services on a contract basis. Publishes *Planning Advisory Service Reports* and *Zoning Digest* monthly. Extended services available to subscribers only.

American Institute of Planners
917 15th Street, NW., Room 800
Washington, D.C. 20005

Provides information and reference services on a limited scale primarily to members, but to others when time and staff permit. Refers inquiries to other specialists or organizations. Publishes *AIP Journal* bimonthly.

International City Management Association
1140 Connecticut Avenue, NW., Suite 201
Washington, D.C. 20036

Provides advisory and consulting services free of charge. Also provides reference services in all aspects of urban planning, development, and other subjects related to urban planning, development, and other subjects related to urban affairs and public administration. Publishes *Urban Data Service* annually.

Downtown Ideas Exchange
555 Madison Avenue, 7th Floor
New York, New York 10022

Provides consulting services for a fee and publications by subscription. Publishes *Downtown Ideas Exchange* semimonthly, and other periodicals and miscellaneous materials in this subject area. Consulting services are provided under the firm name of Alexander and Moskowitz, Inc.

Urban Development and Renewal

Architecture and Urban Studies Library
202 B Taylor Hall
Kent State University
Kent, Ohio 44242

Answers inquiries and provides abstracting and indexing services. Maintains an automatic urban and regional bibliographical information system (URBIS) which now contains approximately 13,000 abstracts. URBIS services are for a fee to customers.

The Non-Profit Housing Center, Inc.
7117 Massachusetts Avenue, NW., Room 403
Washington, D.C. 20036

Answers questions and provides referrals to other organizations. Holds conferences on urban questions, including urban development and renewal. Publishes *City*, bimonthly and *Chronicle,* monthly supplement to *City.*

Urban Land Institute
1200 18th Street, NW., Room 306
Washington, D.C. 20036

Provides answers to technical inquiries, furnishes advisory and consulting services, and refers inquirers to other organizations or specialists. Publishes *Urban Land* monthly, *Land Use Newsletter* monthly, and numerous others. Also prepares short lists of literature citations.

Housing

National Association of Housing and Redevelopment Officials
2600 Virginia Avenue, NW.
Water Gate Building, Suites 404 and 206
Washington, D.C. 20037

Provides informaton on housing and urban renewal and development. Publishes the *Journal of Housing* monthly and the *Housing and Urban Renewal Directory* every 2 to 3 years. Brief questions answered free; more extensive consultation for members only.

Small Home Council-Building Research Council
University of Illinois
1 East St. Mary's Road
Champaign, Illinois 61820

Collects information on construction methods and materials, and design and space utilization for single family housing. Answers questions and gives information concerning current research and development projects. Advisory and consulting services are provided for a fee.

Library

U.S. Department of Housing and Urban Development
451 7th Street, SW., Room 8141
Washington, D.C. 20410
Tel: 202 755–6370

Has consolidated with the Federal Housing Administration Library and the Housing Assistance Administration Library to form a single HUD library. Permits on-site reference and makes interlibrary loans. Answers brief inquiries and provides literature searches for a fee. Publishes *Housing and Planning References,* a monthly index to urban literature, which is available by subscription from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

International Federation for Housing and Planning
43 Wassenaarseweg
The Hague, The Netherlands

Maintains information, documentation and library services which are available to public authorities, professional organizations, and individual specialists concerning housing and town planning.

The following are some selected references on urban affairs:

Urban Affairs Bibliography, Washington, D.C. 20006: Department of Urban Studies, National League of Cities, 1612 K Street, NW., 1969.

Directory of Governmental, Public and Urban Affairs Research Centers at American Colleges and Universities, Davis, Calif. 95616: Institute of Governmental Affairs, University of California, 1968. $2.

A Directory of Urban Research Study Centers, prepared by the Joint Congressional Subcommittee on Urban Affairs, of the Joint Economic Committee. 1967. Washington, D.C. 20402: Superintendent of Documents, U.S. Government Printing Office, 25¢.

Selected Information Sources for Urban Specialists, Washington, D.C. 20402: Superintendent of Documents, U.S. Government Printing Office, 43 pp. 50¢.

Books About Cities, Washington, D.C. 20410: Library, U.S. Department of Housing and Urban Development, 1969. Price unknown.

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Current ERIC Entries on Environmental Education Programs

The references in this section are from the ERIC journals *Research in Education* (RIE) and *Current Index to Journals in Education* (CIJE). Copies of the documents which are abstracted in RIE are available in microfiche and hard copy, at the prices noted, from the ERIC Document Reproduction Service (EDRS), P.O. Drawer O, Bethesda, Maryland 20014.

Descriptive annotations are included with most of the entries in CIJE, but the articles themselves are available only from the journals in which they originally appeared.

Entries from Research in Education

Education and Outdoor Recreation. ED 050 935. 44 pp. MF–$.65; HC–$3.29.

Outlines of Environmental Education. ED 050 973. 257 pp. MF–$.65; HC–$9.87.

A Curriculum Guide in Elementary Social Studies: Man in the Community, Grade Two. ED 051 011. 169 pp. MF–$.65; HC–$6.58.

Selected Bibliography and Audiovisual Materials for Environmental Education. ED 051 069. 46 pp. MF–$.65; HC–$3.29.

The Demonology of Pollution. ED 051 071. 16 pp. MF–$.65; HC–$3.29.

Education for Survival, Massachusetts Resources for Environmental Education. ED 052 986. 97 pp. MF–$.65; HC–$3.29.

The Northwest Environmental Education Center: From Site to Sensibility. ED 053 941. 14 pp. MF–$.65; HC–$3.29.

The Interaction of Man with His Environment. ED 053 945. 320 pp. MF–$.65; HC–$13.16.

An Environmental Experience. Man: Steward of His Environment. ED 053 989. 20 pp. MF–$.65; HC–$3.29.

Environmental Education, A Bibliography Pertaining to the Environment, Environmental Education, and Environmental Education Programs and Materials. ED 053 988. 90 pp. MF–$.65; HC–$3.29.

The Southeastern Regional Conference on the Social Sciences and Environmental Education. ED 053 992. 66 pp. MF–$.65; HC–$3.29.

The 70's, Decade of Environmental Decision: Education and Action Guidelines. Environmental Information Source Guide and Bibliography. ED 054 018. 50 pp. MF–$.65; HC–$3.29.

Science Experience Unit: Conservation. ED 054 129. 46 pp. MF–$.65; HC–$3.29.

A State Plan for Environmental Education ED 054 935. 15 pp. MF–$.65; HC–$3.29.

Environmental Study Area Prototype, Idea Sketch No. 4. ED 054 956. 5 pp. MF–$.65; HC–$3.29.

Teach the Earth Whole ED 055 021. 7 pp. MF–$.65; HC–$3.29.

Entries from Current Index to Journals in Education

"Update on the Report of the NEA Task Force on Environmental Education." *Today's Education* vol. 60 no. 6, pp. 33–48, Sept. 1971. EJ 042 141.

"Environmental Encounters." *American Education,* vol. 7, no. 7, pp. 23–6. Aug.–Sept., 1971. ED 042 144.

"Ecology—A Practical Program in a Suburban School." *Science Teacher,* vol. 38 no. 6, pp. 59–61 Sept. 1971 EJ 042 723.

"Conservation Education in an Illinois High School." *American Biology Teacher,* vol. 33, no. 6, pp. 339–341, Sept. 1971. EJ 043 155.

"Living Library." *Parks and Recreation,* vol. 6, no. 1, pp. 34–5, 63–4, Oct. 1971. EJ 043 637.

"Environmental Studies." *Science Teacher,* vol. 38, no. 7, pp. 36–37, Oct. 1971. EJ 043 822.

"Cooperation With Industry for Vocational Education in Outdoor Recreation." *Agricultural Education Magazine.* vol. 44, no. 5, pp. 124–126, Nov. 1971. EJ 043 829.

"Environmental Specialists—New Link with People." *Extension Service Review,* vol. 42, no. 8, pp. 6–7, Aug. 1971. EJ 043 931.

"Environmental Education and the Elementary School." *Science and Children,* vol. 8, no. 8, pp. 16–17, May 1971. EJ 044 016.

"Developing a Two-Year Course in Environmental Engineering." *Technology School Shop,* vol. 31, no. 2, pp. 54–55, Oct. 1971. EJ 044 041.

"Feeling Our Way to a Good Environment."

American Education, vol. 7, no. 8, pp. 25–8, Oct. 1971. EJ 044 111.

"Solid Waste Recycling—Earth Science in a Real Situation." *Science Teacher,* vol. 38, no. 7, pp. 26–28, Oct. 1971. EJ 044 420.

"Environmental Biology—There's Something More to It." *Science Teacher,* vol. 38, no. 7, pp. 29–30, Oct. 1971. EJ 044 421.

"Environmental Investigations—Getting Help from Uncle Sam." *Science Teacher,* vol. 38, no. 7, pp. 56–63, Oct. 1971. EJ 044 422.

"Cleaner Water Goal of West Virginia Training Program." *Extension Service Review,* vol. 42, no. 8, pp. 14–5, Aug. 1971. EJ 045 004.

"Ecology and Education: An Open System Model for Urban Independent Schools." *Journal of Research and Development in Education,* vol. 4, no. 4, pp. 60–90, Summer 1971. EJ 045 223.

"Education for Living—The Consumer and the Environment. Educational Goals and Public Priorities: Education Commission of the States Annual Meeting. Clinic Session No. 14." *Compact-Special Issues,* vol. 5, pp. 33, 71. EJ 045 711.

"A College Program Based on Ecology." *Phi Delta Kappan,* vol. 53, no. 3, pp. 160–163, Nov. 1971. EJ 045 716.

"Teaching About Pollution Isn't Just Hot Air." *Industrial Arts and Vocational Education,* vol. 60, no. 7, pp. 22+, Oct. 1971. EJ 045 65.

"Designers or Polluters of our Future." *Industrial Arts and National Education,* vol. 60, no. 7, pp. 26–28, Oct. 1971. EJ 045 792.

"Environmental Studies: The Search for an Institutional Form." *Minerva,* vol. 9, no. 4, pp. 493–509, Oct. 1971. EJ 045 792.

"International Environmental Problems." *International Educational and Cultural Exchange,* vol. 7, no. 1, pp. 61–66, Summer 1971. EJ 046 451.

"Building Your Environmental Pollution Library." *Industrial Arts and Vocational Education,* vol. 60, no. 8, pp. 48+, Nov. 1971. EJ 046 547.

Past PREP Reports

The following PREP reports are available only from the ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Maryland 20014, in microfiche (65 cents) and hard copy ($3.29). Order by the ED number provided for each report.

1—*Instructional Television Facilities: A Guide for School Administrators and Board Members.* ED 034 077.

2—*Reading Difficulties: Reading and the Home Environment. The Principal's Responsibility.* ED 034 078.

3—*Establishing Central Reading Clinics: The Administrator's Role.* ED 034 079.

4—*Correcting Reading Problems in the Classroom.* ED 034 080.

5—*Treating Reading Disabilities: The Specialist's Role.* ED 034 081.

6—*Bilingual Education.* ED 034 082.

7—*Research for School Board Members: School-Community Relations.* ED 034 083.

8—*Research for School Board Members: Teacher Militancy, Negotiations, and Strikes.* ED 034 084.

9—*Job-Oriented Education Programs for the Disadvantaged.* ED 034 085.

10—*Seminar on Preparing the Disadvantaged for Jobs: A Planning Handbook.* ED 034 086.

11—*Research on Elementary Mathematics.* ED 034 087.

12—*Paraprofessional Aides.* ED 034 906.

13—*Sharing Educational Services.* ED 036 666.

14—*Social Studies and the Disadvantaged.* ED 037 588.

15—*Student Participation in Academic Governance.* ED 038 555.

16—*Individualized Instruction.* ED 041 185. (Hard copy, $6.58)

17—*Microteaching.* ED 041 190.

18—*Reinforcing Productive Classroom Behavior: A Teacher's Guide to Behavior Modification.* ED 042 061.

19—*Migrant Education.* ED 042 936.

20—*Teacher Recruitment and Selection.* ED 043 797.

21—*Teacher Evaluation.* ED 044 546.

22—*A Readiness Test for Disadvantaged Preschool Children.* ED 047 168.

23—*Educational Cooperatives.* ED 048 521.

The PREP Reports which follow these are available from the U.S. Government Printing Office as shown on the inside front cover of this issue.